

FACTORS INFLUENCING INNOVATION ADOPTION IN A HIGHER EDUCATION INSTITUTION

by

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Abstract

Accelerated skills development and an unconditional pursuit to enhance competencies on numerous levels are two key physiognomies of the post-recession phase of 2008 in South Africa. The focal point of such a process is knowledge, which is viewed as the key factor of production for economic growth. In view of SA's innovation potential and indicators, human resource development was foregrounded as a mechanism that can lead to unequalled economic performance and contribute to the development of a proficiently skilled labour force across all levels of the economy. In order to engage with issues related to human resource development, leading to the promotion of a knowledge-based society, SA needs to commit to initiate or address issues, such as defining the value of knowledge and focusing on innovation leading to a more entrepreneurial society. The conceptual link between higher education and economic growth and the importance of nurturing the knowledge potential of the country cannot be disputed and is addressed in the study through the triple-helix model.

This qualitative case study analysed the concept of innovation adoption within a HE context and factors impacting on the adoption process, by academics. The research was informed by a contextual perspective, and relied on interpretive, constructivist epistemology to reveal these phenomena. The innovation awards process of the institution was chosen as the source from which the units of analysis, the academics, were selected. The nominations of individuals considered as 'innovators' are peer reviewed within the only formal university process giving recognition to academics' endeavours to adopt innovation. The primary research question driving this qualitative study was: To analyse the concept of innovation adoption within a HE context, factors impacting on the adoption process, and the relationships between the identified phenomena, without explaining the reasons behind these relationships.

A literature study identified the main elements of competitiveness and growth, as learning and innovation. Competitiveness is shaped by unique organisational stances and actions, as well as the macroeconomic surroundings in which the institution is situated. Creativity, perceived as a fuelling agent of innovation, acts as an enabler of strategic action, and, as such, should be fostered in human beings. Innovation in HE has its own set of unique

challenges. The study identified the enablers and barriers influencing the process of innovation adoption by academics, highlighting the requirement for change and risk management capabilities and a high value of organisational agility. An innovation-friendly organisational design needs to support an innovation strategy while accountability for innovation must emphasize progress and learning.

External factors, economically, socially and politically motivated, influence the environment in which academics work. Institutions need to be triggered by these external factors and needs to allow academics to reignite their creativity by revelling in the stimulus of the situation and capitalising on the opportunities it presents. This study contributes to the body of knowledge by identifying how an institution, in a specific context, can accept external challenges and create spaces of learning and innovation adoption, leveraging the creativity of academics.

Multiple instances of innovations and innovation attributes were studied in this qualitative case study, and could significantly contribute to the advancement of the empirical knowledge base, as the study utilised replicable measures of innovation adoption attributes and data gathered from participants in the process. The motivation for this study was to determine if a finite number of perceived characteristics are persistently associated with innovation adoption and implementation across diverse situations and technologies within an HE institution. Institutional policies, facilities for teaching and learning, learning policies, and educational paradigms and pedagogies inform usage or non-usage of innovative tools and methods in a department, faculty, or academic institution. This study could serve to inform and focus such policies and paradigms, or direct further research. Recognising and rewarding innovation adoption in the institution could be extended and enhanced.

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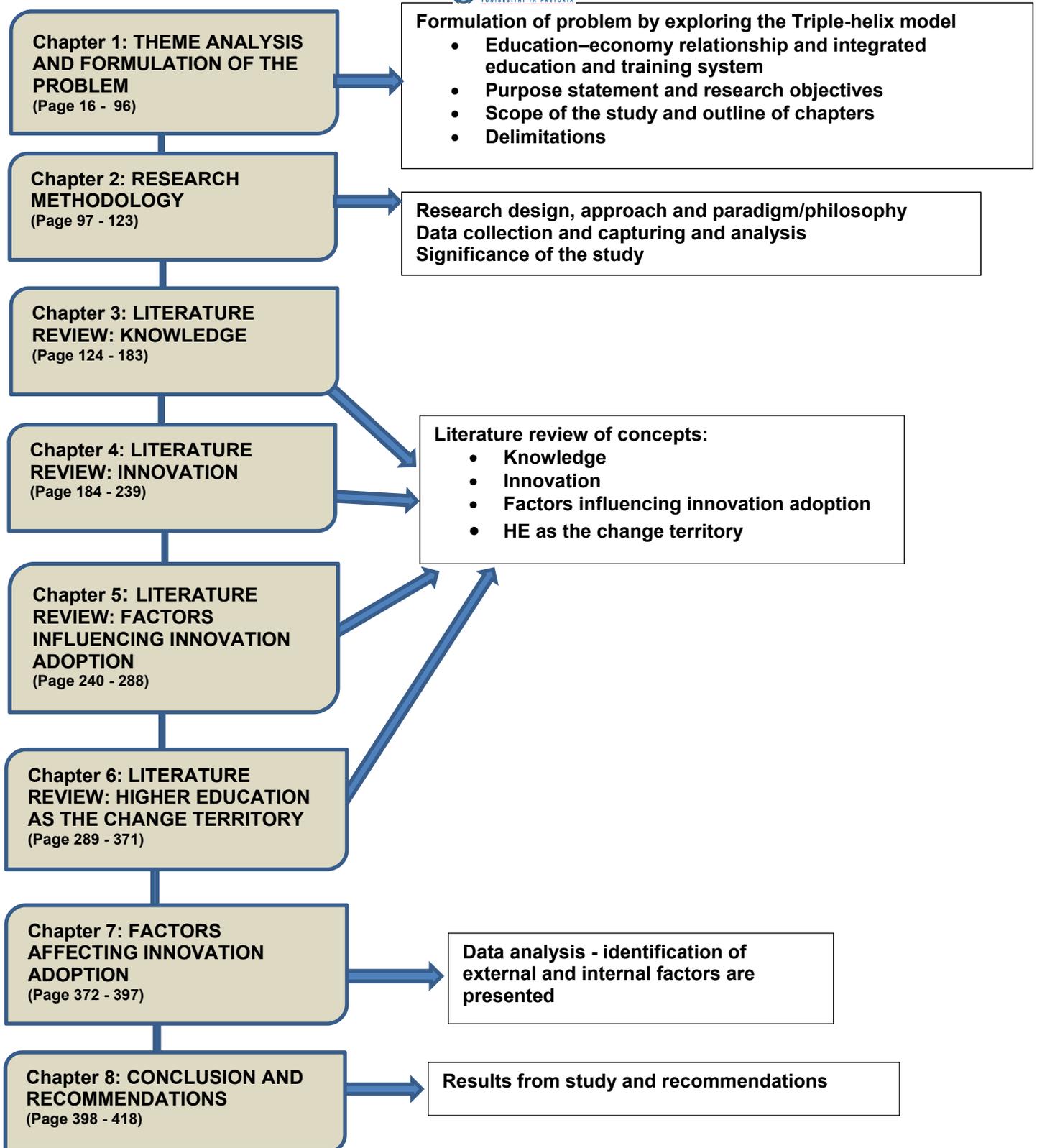


Figure 1: Mindmap of study
Source: Own compilation

FACTORS INFLUENCING INNOVATION ADOPTION IN A HIGHER EDUCATION INSTITUTION

CHAPTER 1: THEME ANALYSIS AND FORMULATION OF THE PROBLEM

1.1 INTRODUCTION

Not knowing that innovation is possible and not knowing conceivable consequences, one is likely to act in a system with a tendency to focus on 'business as usual,' rather than innovative processes. (Johannessen 2008, p. 403)

In the wake of the dotcom bubble (2000–2001), together with the 9/11 terrorist assaults on the United States of America (USA), the majority of advanced economies (including the USA) tried to evade recession by embarking on a period of unrelenting economic growth policies. Vast trade excesses and low interest rates characterised these policies, which stimulated rapid growth in credit. An unparalleled rise in mortgage lending, including subprime market mortgage lending, escalated and fuelled credit growth (Naude 2009, pp. 2-3). In 2008, the world economy, and that of the USA in particular, endured a financial crisis. This was evident in the failure of major financial institutions, the falling of various stock markets, and the significant widening of the spread on a variety of different loans over comparable USA treasury securities (Chari *et al.* 2008, pp. 1-2, p. 11). During 2009, the world experienced the most profound economic slowdown in generations, 'engendering massive contractions in consumer demand, rising unemployment and mounting protectionist pressures worldwide' (Global Competitive Report 2009–2010, p. xi). The banking structure in the USA experienced a liquidity shortfall that prompted this global economic slowdown (Shiller 2008, p. 3).

Shiller (2008, p. 3) identified an assortment of factors that led to the crisis, including substantial disparities in the economic process, the attempt to reduce all values being exchanged to a financial instrument or one imitative of a financial instrument, inefficient regulation, and deficient commercial procedures. Some of these causes are described

as: vulnerable financial systems with unprotected regulation and management of complicated financial mechanisms — easy credit, bad loans and high debt levels that increased the stress on the fragile financial system; unqualified home ownership, promoted by policies; loan securitisation, where the association between the mortgage originator and the recipient of payments was broken; exceptionally low interest loans, allowed by financial contriving practices; an overabundance of new residences, leading to severe price declines; debt defaulting and insolvency of significant financial institutions; the foreclosure crisis; ineffective controls to protect the system and insufficient risk build-up measurement; loss of trustworthiness and financial fear; and selling shares in bulk while cash is stockpiled by both banks and individuals (Shiller 2008, p. 3).

This crisis was largely unexpected, as it followed on seven years of high growth. It commenced in the USA, and a worldwide slowdown was anticipated in developing markets. Following the financial crisis, serious concern about and prediction of a deep global recession loomed (Naude 2009, p. 1). Governments worldwide had to incur extensive financial commitments in an attempt to bail out institutions. Complex and interdependent stock market-, property market-, and the global economy factors, directly and indirectly, and in varying significance, contributed to the expansive financial crisis of 2007 to 2010. The financial crisis led to worldwide stock market downturns, as well as the collapse of large monetary establishments. The world witnessed a momentous decline in economic activity and consumer wealth. Worldwide, economies slowed, which led to the failure of key businesses, tightening of credit, and international trade waning.

The crisis led to substantial asset depreciation, closures of enterprises, mounting unemployment, and a severe plummeting in economic growth. Many countries that were predominantly industrialised entered a recession. Table 1 highlights some of these negative effects.

Table 1: Examples of bail-outs or closures of companies during the economic crisis.

Company	Reason	Bail-out
Chrysler Group LLC, a US-based automobile manufacturer, headquartered in the Detroit suburb of Auburn Hills, Michigan.	Chapter 11 bankruptcy	Federal government finance - US\$6.6 billion
American International Group, Inc. (AIG) (NYSE: AIG), an American insurance corporation, headquarters located in the American International Building in New York City.	Liquidity crisis when its credit ratings were downgraded below "AA" levels	The United States Federal Reserve Bank -\$182.5 billion.
Company	Reason for closure	
New Century Financial Corporation headquartered in Irvine, California, a real-estate investment trust that originated mortgage loans in the US through its operating subsidiaries.	Liquidity problem and significant improper and imprudent practices related to its loan originations, operations, accounting and financial reporting. It also failed to meet certain minimum financial targets required by its warehouse lenders.	
Lehman Brothers Holdings Inc. (Pink Sheets: LEHMQ, former NYSE ticker symbol LEH), global financial services organisation that participated in business in investment banking, equity and fixed-income sales, research and trading, investment management, private equity, and private banking. It was a primary dealer in the US treasury securities market. Headquarters: New York City.	Chapter 11 bankruptcy protection following the massive exodus of most of its clients, drastic losses in its stock, and devaluation of its assets by credit rating agencies.	

Source: (Woods & Dennis 2009, pp. 643-659).

The Eurozone was not spared, and European regional leaders officially announced that there might be sovereign defaults in the Eurozone (Gros 2010, p. 1). Granted that the International Monetary Fund (IMF) projected a contraction of the Eurozone of 0.3 % in 2012, there was no agreement by European leaders on how to address the short-term challenges. They conceded that stabilising the euro and elevating and sustaining the growth path for Europe would lead to progress in the competitiveness of the weaker member states (Global Competitive Index 2012–2013, p. 3). The European crisis deepened (Boone & Johnson 2012), and some of the consequences were that, from December 1998 to December 2009:

- sovereign debt in Greece and Portugal rose by 158% and 152% respectively;

- bank loans in Ireland soared (by 257 % for Bloomberg, Allied Irish, and Bank of Ireland only); and
- In Greece, Ireland, Portugal, and Spain, there was a doubling of loan deposit ratios, while in Italy loan deposit ratios increased by 50%.

(Onado 2011).

Sub-Saharan Africa (SSA), in particular South Africa (SA), was not unaffected by the global financial crisis. Between 2000 and 2007, the SSA region was characterised by abundant liquidity and investors' quests for high returns (Naude 2009, pp. 4-7). The region experienced extraordinary growth in private capital inflow, while, in 2007, private equity, together with debt flow, rose to US\$53 billion. The region enjoyed robust economic growth (a rate of 6.9% in 2007), buttressed by exports and private consumption. However, the global crisis left the SSA countries vulnerable to a reversal of private capital inflow (Macias & Massa 2009, pp. 4-6). The leading effects of the crisis on developing countries were a reduction in export earnings, tourism, and bank lending, and declining remittance flows. The monetary influxes from the rest of the globe that had enabled economic growth, trade, development, and private investment moved to perceived safer havens, resulting in a reduction in growth and an upsurge in unemployment. The reduction in demand further reduced economic growth by drying up the private inflow conduit (the value of 0.5% of growth is equal to approximately US\$5 billion in lost output) and the demand for exports and trade credit (Naude 2009, pp. 4-7).

The effect on SA, in particular, has been described by Macias and Massa (2009, p. 5) as follows:

- bond volumes plunged from US\$492 to US\$337 billion in the period 2007 to 2008;
- the Johannesburg Stock Exchange's (JSE's) All-Share Index dropped by 25.70 % in 2008;
- an important exporter of the platinum consortium of metals, SA, was affected by the weakening value of the metals, and the already sizeable balance-of-payment deficit of the country was challenged by additional stress atop its trade account; and
- the value of SA's currency fell by almost 40%.

SA responded to the international economic crisis collectively, through organised labour, business, and government. SA, like other developing countries, was reliant on the welfare of the global economy, with which it was strongly integrated. Developing countries were influenced by the acute reduction in prices of major export commodities and falling demand for their export products. In addition, the global credit crunch made portfolio investors hesitant to invest in emerging markets, which includes SA. The downturn's depth and duration could not be predicted with certainty, but the SA development forecasts were amended downwards. Prospective growth was lower than had been predicted in 2009 and 2010 (annual gross domestic product (GDP) growth was adjusted for inflation and articulated as a percentage: 2010 = 2.9% (estimate(est.)), 2011 = 3.1% (est.), and 2012 = 2.6% (est.) (IMF, 2013)). This had repercussions in the form of lowered incomes, employment, investment, and social agendas, partly due to the slowdown's effects on government's tax revenues (Framework for SA's Response to the International Economic Crisis 2009, pp. 2-3). Table 2 gives the push and pull factors of foreign direct investment.

Table 2: Foreign direct investment push- and pull factors.

Potential variables determining FDI inflows	Variable measured by
Market size	GDP GDP per capita income Size of middle class population
Economic stability and growth prospects	Interest rates Inflation rates GDP growth rates Industrial production index
Labour cost	Wage rate
Infrastructure facilities	Electricity Water Transportation Telecommunications
Trade openness	(Ratio of Export + Import)/GDP
Currency valuation	Exchange rate
Gross Capital Formation	Related to ownership change

Source: (Viyayakumar *et al.* 2010, pp. 5-6).

The after-effects of the economic crunch were pivotal in SA's co-ordination and efforts to retain and increase employment. According to the framework, a critical component of all sector revival agendas is a focus on developing skills and promoting high-level

competencies. A permutation of actions related to public employment, private sector initiatives, and training could be complementary to counter-cyclical measures to avoid a recession and possible job losses:

- deliberation between financial powers on the issues of interest rate regimes and means of diminishing the cost of capital, as well as the actual interest-rate disparity linking SA and its critical trading allies; and
- ensuring that massive job losses are avoided during a respectable exchange rate period.

The depreciation of the rand could support the trade deficit, with positive consequences for employment and local economic activity. It could also lead to tax relief for low-income workers and support for destitute and beleaguered organisations. It offers the possibility of intensifying exports that create employment, while lessening imports of consumer merchandise that could be produced locally (Framework for SA's Response to the International Economic Crisis 2009, pp. 7-9).

Naude (2009, p. 1) postulated that any apprehension in the wake of the USA's crisis of financial pollution and the undesirable consequence on financial institutions in developing countries was not justified. The reasons for this are summarised in Table 3.

Table 3: Reasons for negative impact on financial organisations in developing countries.

Reasons for negative results on financial organisations in developing countries
Unlike in many previous crises, the epicentre of this crisis was in the developed countries.
Developing-countries' financial sectors had not been as directly affected.
In recent years there has been no measure of decoupling of growth rates between developing and developed countries.
Several developing-country economies are quite resilient as a consequence of good growth, better policies and having learnt lessons during the Asian crisis in 1998.
China and India who both have large emerging markets, continued to grow although a bit more slowly.
The extent of fiscal expansion programmes now being undertaken is likely to cushion the extent and duration of growth declines.

Source: (Naude 2009, p. 1).

Ryan (2010, p. 2) indicated that forces transforming the industrial landscape mean that business thinking should be complemented by innovative thinking, which calls for integration and synthesis. Such business thinking imagines a desired future state while

still working out how to get there. Unearthing strategic problems and considering various disciplines (business strategy, marketing and research, and product and process design) to resolve these problems require a core competency: creativity. Creativity is the fuelling agent in innovation in organisational processes, products, and service delivery (Datta 2007, p 293). Creative and innovative thinking should be encouraged by a national innovation strategy aimed at nurturing the growth, proliferation, and capable management of novel products, processes, and services. Atkinson (2010) argued that promoting innovation to create social and economic well-being should vigorously predict and articulate the relationship between the areas of: science and technology policies; teaching and employee instruction; research and development; emigration and immigration; tax; trade; intellectual property; and digital infrastructure.

The Global Competitive Report (GCR) for 2010–2011 elaborated on the strong interdependence between core role players in the global economy, highlighting the concept of interconnected economies and competitiveness and the need for new policy frameworks to manage these new economic challenges during mounting uncertainty. The IMF needs to play a central role with regard to global macroeconomic policy coordination, in order to give developing countries a voice on issues (Jones 2009, p. 12). According to the GCR for 2010–2011, countries need to ensure that robust fundamentals strengthen economic development and growth, to buttress competitiveness in the long run, but also to address short-term urgencies in the challenging economic environment. Productivity enhancements to ensure future prosperity are the cornerstone of competitive economies, and can help national economies endure business cycle downturns.

Globally, competitive countries need to put in place mechanisms that will enable solid economic performance and manage risk, while taking cognisance of events proceedings on future wealth grounded in sustained growth (GCR 2009–2010, pp. 3-4). Financial freedom needs to be guided by stronger provident regulation and management. This was largely ignored by the USA and the United Kingdom (UK), where liberalisation was accompanied by deregulation and weak management of financial intermediation (Jones 2009, p. 11).

For some time, the World Economic Forum (WEF) has quantified the productive potential of nations worldwide, and reported on them in the GCR. This report gives an understanding of the vital factors determining economic growth, while exploring countries' varied success in elevating population prospects and income levels. The critical benchmarking study and measure on the productive potential of nations worldwide also facilitates the formulation of economic policies and institutional transformation, while stimulating dialogue on strategies to improve countrywide competitiveness (GCR 2010–2011).

The GCR for 2012 to 2013 encompasses a total of 144 economies, and is used in the present as a benchmarking instrument to identify obstacles to improved competitiveness. A detailed profile of each country is presented, together with tables of data, reflecting the global rankings covering over 100 indicators. Policymakers, as well as business leaders, benefit from the report, and use it to devise strategies to overcome the identified obstacles. The report encompasses both the static and dynamic components of the competitiveness of nations, calculated using many complex determinants that are not mutually exclusive. The GCR indices reflects competitiveness as a weighted average of these determinants, grouped into 12 pillars (GCR 2009–2010, pp. 4-7), as portrayed in Table 4.

Table 4: Grouped determinants used in the GCI.

GLOBAL COMPETITIVENESS INDEX	
Pillar	Description
Basic requirements sub-index Key for factor-driven economies	
1. Institutions	The institutional environment is determined by the legal and administrative framework within which individuals, organisations and governments interact to generate income and wealth in the economy. The importance of a solid institutional environment has become even more important.
2. Infrastructure	Extensive and efficient infrastructure is an essential driver of competitiveness. It is critical for ensuring the effective functioning of the economy as it is an important factor determining the location of economic activity and the kinds of activities or sectors that can develop in a particular economy.
3. Macroeconomic stability	The stability of the macroeconomic environment is important for business and therefore is important for the overall competitiveness of a country.
4. Health and primary education	A healthy workforce is vital to a country's competitiveness and productivity. Workers who are ill cannot work.

Efficiency enhancers sub-index Key for efficiency-driven economies	
5. Higher education and training	Quality higher education and training is crucial for economies that want to move up the value chain beyond simple production processes and products. In particular, today's globalising economy requires economies to nurture pools of well-educated workers who are able to adapt rapidly to their changing environment. This pillar measures secondary and tertiary enrolment rates as well as the quality of education as assessed by the business community. The extent of staff training is also taken into consideration because of the importance of vocational and continuous on-the-job training - which is neglected in many economies - for ensuring a constant upgrading of workers' skills to the changing needs of the evolving economy.
6. Goods market efficiency	Countries with efficient goods markets are well positioned to produce the right mix of products and services, given supply-and-demand conditions as well as to ensure that these goods can be most effectively traded in the economy.
7. Labor market efficiency	The efficiency and flexibility of the labour market are critical for ensuring that workers are allocated to their most efficient use in the economy and provided with incentives to give their best effort in their jobs. Labour markets must therefore have the flexibility to shift workers from one economic activity to another rapidly and at low cost and to allow for wage fluctuations without much social disruption.
8. Financial market development	The recent financial crisis has highlighted the central role of a sound and well-functioning financial sector for economic activities. An efficient financial sector allocates the resources saved by a nation's citizens, as well as those entering the economy from abroad, to their most productive uses. It channels resources to those entrepreneurial or investment projects with the highest expected rates of return rather than to the politically connected. A thorough and proper assessment of risk is therefore a key ingredient. Business investment is critical to productivity. Therefore economies require sophisticated financial markets that can make capital available for private-sector investment from such sources as loans from a sound banking sector, properly regulated securities exchanges, venture capital, and other financial products. The importance of such access to capital was recently underscored by the liquidity crunch experienced by businesses and the public sector in both developing and developed countries. In order to fulfill all those functions, the banking sector needs to be trustworthy and transparent, and - as has been made so clear recently - financial markets need appropriate regulation to protect investors and other actors in the economy at large.
9. Technological readiness	This pillar measures the agility with which an economy adopts existing technologies to enhance the productivity of its industries. It is important to note that in this context the level of technology available to organisations in a country needs to be distinguished from the country's ability to innovate and expand the frontiers of knowledge. That is why we separate technological readiness from innovation that is captured in the 12th pillar below.
10. Market size	The size of the market affects productivity because large markets allow organisations to exploit economies of scale. Traditionally the markets available to organisations have been constrained by national borders. In the era of globalization international markets have become a substitute for domestic markets especially for small countries. There is vast empirical evidence showing that trade openness is positively associated with growth.

Innovation and sophistication factors sub-index Key for innovation-driven economies	
11. Business sophistication	Business sophistication is conducive to higher efficiency in the production of goods and services. This leads, in turn, to increased productivity, thus enhancing a nation's competitiveness. Business sophistication concerns the quality of a country's overall business networks as well as the quality of individual organisations' operations and strategies.
12. Innovation	The final pillar of competitiveness is innovation. Although substantial gains can be obtained by improving institutions, building infrastructure, reducing macro-economic instability, or improving human capital, all these factors eventually seem to run into diminishing returns. The same is true for the efficiency of the labour, financial, and goods markets. In the long run, standards of living can be expanded only by innovation. Innovation is particularly important for economies as they approach the frontiers of knowledge and the possibility of integrating and adapting exogenous technologies tends to disappear.

Source: (Adapted from the GCR 2009–2010, pp. 4-7).

The innovation pillar in the GCR highlights the importance of innovation for economies (2009–2010, pp. 4-7), necessitating a brief description of the status of innovation in the USA, Europe, and the Asian regions, all major players in the global economy. This global view is given in Table 5.

Table 5: A global view of innovation.

Country / Region	Status
United States	America has a history of rewarding creativity and generating innovation. Currently it lags in research and innovation behind China, Taiwan, South Korea and Japan and may lose its lead in science and technology.
Europe	Initiatives have been introduced to encourage and nurture innovation throughout Europe. March 2000 launched the 'Lisbon strategy' placing innovation at the centre of all policy efforts. Commitment was made to make Europe 'the most competitive and dynamic knowledge-based economy in the world by 2010'.
Asian region	Advancing fast and challenging America's lead in research and innovation (Silverthorne, 2005). In a survey of mostly Fortune 500 companies (200 companies) it was found when outsourcing technology jobs (research, HR functions and engineering services), companies were likely to send work to the following countries: <ul style="list-style-type: none"> • India (69%) • China (8%) • Philippines (5%) • Latin America (5%) • Eastern Europe (4%) • Caribbean/Mexico (2%) (Silverthorne, 2005). The region offers greatest potential where advanced technology and innovation are concerned. The region is preparing for the next wave of innovations in the areas of nanotechnology, biotechnology and robotics. Problems in the region: <ul style="list-style-type: none"> • China faces segmentation in innovation policies and bureaucracy is difficult to penetrate. China lacks a culture that encourages creativity and risk-taking amongst scientists • India's gap between industry and academia is too large, hindering free exchange of ideas and flow of information, while education and research institutes do nothing to encourage a culture of experimentation (Padma, 2007).

Source: (Adapted from Ailin and Lindgren 2008, pp. 91-93).

Focusing on the African continent, Pouris (2007) categorically stated that innovation statistics for this continent reflect that:

- research in the continent is concentrated in SA and Egypt — these two countries produced 68 945 publications in 2000–2004, which was 1.8% of the world’s publications;
- few countries on the continent have the minimum number of required scientists for the functioning of a scientific discipline;
- 80% of innovative activity is in SA; and
- Africa produces less than 1 000 of the world’s inventions (2000–2004 period).

The statistical evidence shows that African countries should increase their research and development (R&D) expenditure. In 2004, the Organisation for Economic Co-operation and Development’s (OECD’s) member countries (34 countries) disbursed an average 2.3% of their GDP on R&D; China spent 1.35% in the same year, whereas SA invested only 0.91% of its GDP on R&D. The 2014 Global Innovation Index (GII) gives the scores related to SA for 2014, and highlights the areas the country needs to prioritise and improve to better its rating. Table 6 gives a profile of SA’s economy.

Table 6: Country/Economy Profile for SA.

Key indicators		
Population (millions)	51.2	
GDP (US\$ billions)	350.8	
GDP per capita, PPP\$	11,259.1	
Income group	Upper-middle income	
Region	Sub-Saharan Africa	
GII	37.6	58
(the average of the input and output sub-indices)	(2013 out of 142)	(2013 out of 142)
	38.2	53
	(2014 out of 143)	(2014 out of 143)
Innovation Efficiency	0.7	93
(the ratio of the output sub-index over the input sub-index. It shows how much innovation output a given country is getting for its inputs)		

Input Pillars (The Innovation Input Sub-Index is the simple average of the first five pillar scores)	Score (0–100) or value (hard data)	Rank
Innovation Input Sub-Index	45.6	47
Institutions	69.9	44
• Political environment	63.5	54
• Regulatory environment	75.5	39
• Business environment	70.8	45
Human capital and research	28.7	70
• Education	34.5	99
• Tertiary education	n/a	n/a
• Research & development	22.8	40
Infrastructure	32.9	84
• ICTs	31.6	86
• General infrastructure	37.6	52
• Ecological sustainability	29.5	95
Market sophistication	63.8	18
• Credit	47.2	39
• Investment	66.6	12
• Trade & competition	77.6	44
Business sophistication	32.7	68
• Knowledge workers	40.8	63
• Innovation linkages	30.4	75
• Knowledge absorption	26.8	59
Output Pillars (The Innovation Output Sub-Index is the simple average of the last two pillar scores)	Score (0–100) or value (hard data)	Rank
Innovation Output Sub-Index	30.9	63
Knowledge & technology outputs	29.1	62
• Knowledge creation	18.2	59
• Knowledge impact	44.5	45
• Knowledge diffusion	24.7	112
Creative outputs	32.7	70
• Creative intangibles	44.7	71
• Creative goods & services	18.2	68
• Online creativity	23.1	62

Source: (GII 2014, pp. 256).

South Africa with the largest economy in SSA, accounts for a third of the region's GDP and is regarded as "the gateway to Africa" (South Africa's position in BRICS 2013, pp. 7). As a result of these and other reasons SA was invited to join the BRIC group, an acronym

for the developing national economies Brazil, Russia, India and China. BRIC is a self-governing international association that was formed in 2011 to promote collaboration (commercial, political, and cultural) between the partners. The inaugural BRIC summit (which excluded SA) took place in Yekaterinburg, Russia, on June 16, 2009, and was focused on ways of improving the universal economic situation, revolutionising monetary establishments, and becoming more involved in global affairs. After SA joined the acronym was changed to BRICS. Provided in table format, below, is a comparison of noteworthy financial and social indicators of the BRICS countries.

Table 7: Comparison of economic and social indicators within the BRICS countries.

Comparison of Economic and Social Indicators within the BRICS countries	Unit	Year	Value
POPULATION			
Mid-Year Population			
Brazil	millions persons	2012	193
Russia	millions persons	2012	143.2(P)
India (As on 1st March 2011)	millions persons	2011	1 210
China	millions persons	2012	1 351(P)
South Africa	millions persons	2011	51
ECONOMICALLY ACTIVE POPULATION			
Economically active Population (% Share)			
Brazil	%	2011	68.6
Russia	%	2012	53
India	%	2011	53
China	%	2012	56.6(P)
South Africa	%	2012	35.4
Unemployment Rate (%)			
Brazil	%	2011	6.7
Russia	%	2012	5.5
India	%	2011-12	3.8
China Unemployment Rate in Urban Area	%	2012	4.1(P)
South Africa	%	2012	25.1
NATIONAL ACCOUNTS			
GDP (Current Prices)			
Brazil	Billion U \$	2012	2253
Russia	Billion U \$	2012	2007.2(P)
The data of India are by fiscal years which are from April 1 of the current year through March 31 of the next year. Includes all type of iron ore. Monthly per capita consumer expenditure based on "last 365 days" reference period.			
China	Billion U \$	2012	8 226.9(P)
South Africa	Billion U \$	2012	384
Per Capita GDP (Current Prices)			
Brazil	US\$	2012	11 463
Russia	US\$	2012	14 015(P)
India	US\$	2011-12	1440

Source: (BRICS Joint Statistical Publication 2013, pp. 1-8).

Members in the BRICS grouping are either emerging or recently industrialised nations, with the probable exception of Russia. They are differentiated by a noteworthy influence on affairs, both regional and global, as well as a recurring element of strong growth in domestic demand. These countries also attract large capital, as their high potential consumer markets have communal characteristics with large populations (Viyayakumar *et al.* 2010, p. 2). Since 2013, the BRICS nations have comprised nearly three billion people (a third of the world's six billion population), with a minimal GDP of US\$14.8 trillion and combined foreign reserves of an estimated US\$4 trillion (Marquand 2011, p. 1). The BRICS countries growth prospects are portrayed in Table 8.

Table 8: BRICS countries' growth prospects.

BRICS countries	Brazil	Russia	India	China	South Africa
Past decade GDP per country	3.3%	7%	7%	10%	4.6%
	Dominate supply of raw materials (natural resources)		Dominant global suppliers of manufactured goods and services (use manufacturing to employ hundreds of millions of people)		Biggest economy in African continent
Demographic trends / Labour supply dynamics / Urbanisation rate	Working-age population continues to expand Working-age: 20% increase Domestic investment ratios = 20–23 % of GDP	Risk of collapsing Urbanisation = high Decline in working age Domestic investment ratios = 20–23 % of GDP	Working-age population continues to expand Solid population growth Lower degree of urbanisation Domestic investment ratios = 30% of GDP	Decline after 2015 (40% urbanisation) Domestic investment ratios = 40% of GDP	Working-age population continues to expand Solid population growth Lower degree of urbanisation Domestic investment ratios = 20–23 % of GDP

Source: (Viyayakumar *et al.* 2010, pp. 5-6).

Marquand (2011, pp. 1-2) argued that the 'spheres of influence' between two powers during the Cold War have passed, and that the USA's supremacy has diminished. Unfortunately, this was not replaced with distinct leadership or rules, which led to lawless competition, coupled with the tendency to violate human rights, democracy, and sovereignty. The world fraternity is being presented with novel challenges by the BRICS

countries, as they are perceived by Europe to be less concerned with shared concepts of a complex world, emphasising their own new strengths and interests, and leaning towards a patriotic, multipolar world. Robins (2013, p. 1) cautioned that the BRICS countries share too little abroad, and that the stakes are too high internally for them to have an articulated function on the global stage. Marquand (2011, p. 1) defined BRICS as a concept rather than a cohesive force. Observations related to BRICS countries are captured in Table 9.

Table 9: BRICS information.

BRICS' Emergence and Growth	<p>In 2010, 231 (11.5 %) companies listed in the Forbes Global 2000 originated in BRICs, up from only 83 companies (4 %) in 2005 (Gaunt 2010).</p> <p>In 2011–12, the BRICS economies grew by 7.5 %, while G-7 countries grew by 1.5 %</p> <p>In 2012, BRICS' contribution to global economic growth reached 50 % (BRICS New Delhi Summit 2012).</p> <p>2013: over the past decade FDI going into BRICS has more than tripled, totalling \$263 billion in 2012 (20 % of world FDI flows)(The Global Investment Trends Monitor (GITM))</p> <p>Investment from BRICS to other countries has climbed from \$7 billion in 2000 to \$126 billion in 2012, rising from 1 % of the world flows to 9 % (SAFPI 2013).</p> <p>BRICS countries accounts about 1, 8 % of GDP's but these countries are not the decision makers in the international economic system, they are only the athletes</p>
BRICS agenda	<ul style="list-style-type: none"> • sustainable development • financial and macroeconomic management • investment • trade • technology and innovation • health • agriculture • energy • environment • climate change • food security • reformation of the UN Security Council • responses to crises and conflicts in different parts of the world
BRICS Countries are changing the Economic Landscape in Africa	<p>GDP growth of 4 % in 2013, projected to 4.7 % in 2014 and 5 % in 2015</p> <p>BRICS countries trade more with Africa than they do among themselves (African Development Bank 2013).</p> <p>India and China's trade with Africa as a proportion of their GDP in 2012 was 1.4 % and 1.6 %, respectively, Brazil—1.2 %, Russia—0.3 % and South Africa—4 % in 2011</p> <p>Africa's export growth between 2005 and 2011 to China was 28 %, to Brazil—14.9 % and to India—41.8 % (to USA—11.5 %). Africa is a major supplier of natural resources for these countries.</p> <p>FDI from BRICS enables technology upgrading and employment in African countries. According to UNCTAD, in 2009, 45 % of international joint ventures in Africa were with firms from the developing countries such as BRICS.</p>
China	<p>In 2012, China contributed 26 % of world GDP growth and in 2013—29 % (Gleason 2014). China is Africa's largest trading partner. China–Africa trade increased from \$11 billion in 2000 to \$210.2 billion in 2013 (Xinhua 23 April 2014). China's exports to Africa have grown at a pace five percentage points faster than to any other region in 2012, while China's imports from Africa have increased by 26 %, which is twice the speed of China's imports from any other region. Currently China accounts for 20 % of Africa's trade. Africa is China's fastest growing export destination and trade partner. In Africa, Beijing has already become the main donor and the biggest investor among BRICS countries. China provides aid to almost all African countries, although its financing activities are concentrated in the resource-rich countries. In 2012, China declared \$20 billion credit to African countries for developing infrastructure and the African Talent Programme, which intended to train 30,000 Africans in various sectors.</p> <p>At the end of 2012, the African Development Bank (ADB) estimated that Chinese investments in Africa totalled \$20 billion (CNV 2014).</p> <p>China is shifting development assistance for Africa from 'hard' infrastructure assistance to a 'soft' ones</p>

	<p>China plays a significant role in peacekeeping operations in Africa</p>
India	<p>India–Africa trade volume in 2010 was \$46 billion (The Economist 2011); in 2012, it rose to \$70.3 billion (India Business News 2013).</p> <p>India has also increased development aid for African projects. India has also made large contributions to the UN peacekeeping activities in Africa. It is the first of the BRICS countries and the third largest world contributor to peacekeeping with more than 8000 peacekeepers deployed in various UN missions. India and China also take part in the struggle against piracy of the coast of Somalia. Three ships of the Indian Navy patrol the Gulf, the Arabian Sea and the area near the Seychelles at any given time</p>
Brazil	<p>Trade between Brazil and Africa increased sharply in the last decade, jumping from \$4.2 billion in 2002 to \$26.5 billion in 2012. Minerals and crude materials make up at least 80 % of Brazil's imports from the continent, while Africa imports mostly agricultural products along with ethanol and car parts.</p> <p>The 'Agência Brasileira de Cooperação' (ABC) was developing 77 technical co-operation projects, more than half of them in the African continent. In 2009, African nations accounted for 50 per cent of ABC's budget and in 2010, this percentage increased to 60 per cent.</p> <p>In 2012, Brazil also set up a national programme that increased family-based agriculture.</p> <p>The Brazilian National Bank for Social and Economic Development (BNDES) has started in 2009 a line of credit worth \$265 million and another one worth \$360 million in 2010 for companies that were willing to conduct business in Africa</p> <p>Brazil has provided scholarships for African students to complete their graduate and undergraduate education in Brazilian public institutions. Brazil participates in UN peacekeeping missions</p>
Russia	<p>Russia lags behind China, India and Brazil in promoting its interests in Africa. Foreign trade turnover in 2013 amounted to \$9 billion</p> <p>The largest part of Russia's imports from Africa is made up of foods, cocoa (16 %) and tobacco (9 %), although ores, uranium and iron are of growing importance as its own resource base declines. Russia's top African partners on import are South Africa (22 %), Morocco (19 %), Egypt (13 %); top partners in export are Egypt (48 %), Morocco (16 %) and Tunisia (12 %). Russia introduced a preferential system for the African traditional export commodities: no import duties and no quota limitations.</p> <p>Russia has written off \$20 billion of African debts. In 2009–12, it allocated \$100 million for aid to the poorest countries (Russia Slashes Africa's Debt and Increases Aid, 2012). In recent years, Russian aid has focused on food security and health programmes.</p> <p>In 2010, it paid \$98.2 million for agricultural training and technology in African countries.</p> <p>Russia's voluntary contribution to the Global Fund against AIDS, TB, malaria is \$40 million.</p> <p>Russia has contributed \$20 million to the WB Programme against malaria in Africa and paid \$18 million to finance the World Health Organization's measures against polio. Russia is also involved in educating and training.</p> <p>Russia is also involved in educating and training professionals. In 2008–12, it allocated \$43 million to the WB for the implementation of an international programme of raising the quality of basic education, which was initiated by Russia.</p> <p>Overall, Russian assets in Africa are estimated at \$8–10 billion (BRICS–Africa Partnership and Interaction, 2013).</p> <p>Russia wants BRICS to be seen as 'a new model of global relations, which supersedes the old division lines between the East and the West or between the North and the South'.</p>
South Africa	<p>South Africa is a smaller economy and its GDP growth rate does not quite match up to the other players in the group. Nevertheless, the country's influence within Africa makes this country an attractive partner for the BRICS' members.</p> <p>South Africa's accession to the group was in large part premised on this country's role as a financial and logistical gateway to Sub-Saharan Africa, and on the continent's huge economic potential'</p> <p>The continent's five largest banks are South African and all of them finance African projects, though only the Standard Bank has an extensive continent-wide footprint. South Africa takes part in nine big African projects in the framework of the President's Infrastructure Champion Initiative (PICI) and finances them fully.</p> <p>South African trade with other African countries has grown from \$21.4 billion in 2011 to \$24.5 billion in 2012 (SA exports to the value of \$14.494 billion, imports to the value of \$10.019 billion.</p> <p>South Africa is second after India as a BRICS contributor to African peacekeeping.</p>

Source: (Deych 2015, pp. 170-181).

The BRICS summits habitually give rise to arguments about the characteristics of the foreign policies of the member states. The diverse characteristics of the members, present trade opportunities. In terms of economic variables the main weaknesses and strengths, of the respective BRICS countries, are portrayed in Table 10.

Table 10: Key strengths and weaknesses of BRICS countries.

Country	Key Strengths	Key Weaknesses
Brazil	Boasts abundant natural resources (iron ore, hydropower, timber, coffee, soya beans, sugar cane, iron and crude oil).	Lacking economic infrastructure (poor investment in road, rail ports and energy). Very high lending interest rate (averaging to 16.25 percent)
Russia	Has a wealth of natural resources dominated by huge deposits of oil, natural gas, coal and other minerals. A skilled labour force. Relative political stability	Has amongst the lowest investment rates compared to other emerging economies, resulting in industries not being competitive due to obsolete capital equipment.
India	Strong information & technology sector and service sector. Has some natural resources (coal, manganese and natural gas)	Very large public debt as percentage of GDP (± 74 percent). Debt service costs eroding funds for development spending.
China	Very strong manufacturing base. Industrially competitive. Strong foreign financial investment. Possess large deposits of coal, iron ore, petroleum and natural gas.	Environmental issues becoming obstacles to sustainable growth. Increasing income inequality resulting in social tension.
South Africa	Abundant deposits of gold, platinum, coal and chromium. Fairly stable political environment. Competitive financial and business service sector.	Very high unemployment rate. The insignificance of the country's economy compared to other BRICS members. Rising labour cost. Declining manufacturing sub-sector to GDP.

Source: (South Africa's position in BRICS 2013, pp. 11).

The growing influence of the BRICS powers in Africa poses the question of whether SA's own internal governance issues, structured by its mode of incorporation into the global political economy, means it is becoming part of a submerging, rather than an emerging, middle. SA has attempted to navigate the currents of globalisation by opening its economy and promoting market opening in Africa, while attempting to reform the system of global governance in order to be more favorable towards developing countries (Bond & Zapiro 2004). SA therefore serves as a conduit for globalised and marketised geo-

governance in SSA persisting to be as a very important regional influence, because of the size of its economy, the power of its state, and capital–state interactions. This is reflected in its growing international authority and the changing nature of worldwide governance, seen in the following figures:

- SA's trade with the rest of Africa was about a third of that of China (Daniel & Bhengu 2009), despite having an economy of only around one-tenth the size of that of China (2006).
- SA was the largest single foreign investor in the rest of the continent (Adebajo 2010).
- SA's economy accounted for about 80% of the total for the Southern African Development community (SADC) with its 13 member countries (Adebajo *et al.* 2007).
- SA with its 50 million inhabitants accounts for over one third of SSA's economy, and 17 of the top 20 companies in Africa are South African (Africa Report 2011).
- SA investment in the countries of the SADC region was almost a billion dollars per year between 1994 and 2004. (United Nations Conference on Trade and Development 2005).
- SA ranked as one of the top three sources of foreign direct investment (FDI) in ten of those countries (SADC countries: Angola, Botswana, Democratic Republic of Congo, Lesotho, Madagascar, Malawi, Mauritius, Mozambique, Namibia, Seychelles, South Africa, Swaziland, United Republic of Tanzania, Zambia, Zimbabwe) (United Nations Conference on Trade and Development 2005).

Of all world regions, SSA faces the biggest competitiveness challenges.

Among the BRICS economies, SA is placed third, while it is perceived to be the highest-rated economy in SSA. This ranking is a result of being ranked 52nd in the GCI of 2012 – 2013, with all its combined attributes, for example, intellectual property protection (20th), property rights (26th), the accountability of its private institutions (2nd), its goods market efficiency (32nd), and its financial market development (3rd). To enhance its competitiveness, SA needs to concentrate on its vulnerabilities, including labour-market inefficiency (113th), rigid appointing and dismissal practices (143rd), inflexible wage determination by organisations (140th), and considerable tension in relations between labour and employer (144th). An unknowledgeable workforce is one of the biggest hindrances in doing business (GCI 2012–2013, pp. 38-40).

In view of these indicators, SA needs to cultivate production processes that are effectual and that impact on product quality. According to the GCI, competitiveness is increasingly driven by the pillars given in Table 11 while SA companies' regional impact through investments, is given in Table 12.

Table 11: Pillars that drive competitiveness, according to the GCI.

Pillars	Description
5	Higher education and training
6	Efficient goods markets;
7	Well-functioning labour markets
8	Developed financial market
9	Ability to harness the benefits of existing technologies
10	Large domestic or foreign market

Source: (GCI 2012–2013, pp. 8-9).

Table 12: SA companies' regional impact through investments.

Knowledge economy indicators: South Africa compared to Organisation for Economic Cooperation and Development (OECD) countries		
% of gross domestic product spent on research and development (2006)	South Africa – 0.95	OECD average – 2.26
Number of researchers per thousand employed (2005)	South Africa – 1.4	OECD average – 7.3
Triadic per million population (2006)	South Africa – 0.6	Switzerland – 114.8
Exports of information and communication technology equipment. Millions of US dollars (2007)	South Africa – 1142	Ireland – 23 532
ISO 9001 Certifications (2008)	South Africa – 3792	United Kingdom – 41 150
Sources: OECD (2009) and ISO (2009). Triadic patents refer to the number of patents registered in the European Union, Japan and the United States. International Standards Organisation 9001 certifications are given for quality management systems.		

Source: (Carmody 2012, p. 229).

Carmody (2012, pp. 223-241) acknowledged that, in addition, SA has attracted highly skilled workers from SSA, but also loses highly skilled personnel to rich countries. In 2001, 18% of the outflow of R&D staff in SA's scientific councils was to overseas jobs (Kahn *et al.* 2004). There is, however, a certain amount of 'brain circulation', as knowledge workers leave and come back, and SA attracts them from the region.

However, the impact of SA on the region is one of a brain drain, as the country arguably attempts to move up the surplus value chain. At the same time that SA has attracted highly skilled immigrants, it has shut out low-skilled ones. SA is, however, under pressure from an increasing Asian presence in Africa. Industrialised SA faces potential competitive pressures from the industrialised East that are unlike those of Africa's primary producers (Martin 2008, p. 129). In relation to China, 'SA exports base metals and mineral products in exchange for machinery, textiles, clothing and footwear. It is exporting fewer advanced manufactured goods to China now than it did in 1993. China, on the other hand, has been exporting greater and greater quantities of advanced goods' (Willcox & Van Seventer 2005, p. 211).

Within the BRICS grouping, SA has a significant role to fulfil: first, as the ingress to the African region, and, secondly, as a catalytic agent for integration of the African continent. At the last BRICS summit (held in May 2013), it was said that SA 'has a big role to play [within the grouping] and probably quite a responsibility in being some kind of genuine gateway to helping the rest of Africa become more successful' (O'Neill 2013). On condition that it enhances its technology, education, and governance standards, and bolsters its commerce and infrastructure webs, 'then my goodness me, it is not only the next decade [that is going to be Africa's], it is going to be the next three or four' (O'Neill 2013). The desirable features of SA for the BRICS association are its prospective customer market with a greater middle-income group, together with its copious natural resources. These are buttressed by sound, developed financial parameters and communication networks, underwritten by a sophisticated legal system. The country boasts an effective transport and energy sector, complemented by modern infrastructure sustaining the well-organised dissemination of goods and services (Viyayakumar *et al.* 2010, p. 2).

The BRICS grouping may seem fragile (encompassing five diverse economies), but it is progressively more evident that China, its leading member, is infusing it with an impetus many thought would soon diminish. China is devoted to the development of the BRICS grouping, and this commitment springs from a business interest and practical geopolitical demand (Freemantle 2013). The benefit for SA to be part of BRICS is that it will attract

more FDI from BRICS partners to stimulate economic growth; the copious natural resources opens up opportunities for trade with other BRICS countries; and SA could receive more global exposure.

The next section will examine SA's potential to bridge the chasm between itself and other knowledge-driven nations by examining its innovation potential.

1.2 SA's INNOVATION POTENTIAL AND INDICATORS

Comparing the competitive position of countries on a global scale, as described in the GCR (2010–2011), is a measure to identify distinguishing indicators that influence the productive potential of countries, which can be acted upon to advance their economic competitiveness. The top ten countries in the GII for 2012–2013 were: Switzerland, Singapore, Finland, Sweden, the Netherlands, Germany, the USA, the UK, Hong Kong (formally known as the Hong Kong Special Administrative Region (HKSAR), and Japan. Comparing Switzerland, the world's most competitive economy (Global Competitive Index (GCI), 2009 to 2013) against those of the two largest emerging markets — China (27th) and India (51st) (SA's BRICS partners), as well as against SA (54th) and Namibia (74th), both also emerging markets in SSA, highlights the opportunity for SA to improve its GCR position. The following table reflects these countries' scores, using the 12 mentioned pillars, taking into account the phase of development in which the country is categorised.

Table 13: Comparison of GCI scores — Switzerland and SA.

Stages (SA Score / Switzerland Score / China Score / India Score / Namibia Score)	Hinges on pillars (SA Score / Switzerland Score / China Score / India Score / Namibia Score)	Sub-index weights used to score countries, per stage of development. (Total = %)																																																														
Key to categorising countries in stages Stage 1: GDP per capita (in US\$) < 2,000 Transition from Stage 1 to Stage 2: GDP per capita (in US\$) 2 000–3 000 Stage 2: GDP per capita (in US\$) 3 000–9 000 Transition from Stage 2 to Stage 3: GDP per capita (in US\$) 9 000–17 000 Stage 3: GDP per capita (in US\$) > 17 000		Basic require-ments	Efficiency enhan-cers	Innova-tion sophisti-cation factors																																																												
Stage 1. Factor-driven – 38 countries (India falls in this category) <table border="1" data-bbox="161 824 536 1012"> <tr> <td>2010-2011</td> <td>79</td> <td>2</td> <td>30</td> <td>81</td> <td>54</td> </tr> <tr> <td>2012-2013</td> <td>84</td> <td>2</td> <td>31</td> <td>85</td> <td>82</td> </tr> </table> <p>Countries compete based on their factor endowments: primarily unskilled labour and natural resources. Companies compete on the basis of price and sell basic products or commodities, with their low productivity reflected in low wages.</p>	2010-2011	79	2	30	81	54	2012-2013	84	2	31	85	82	1 = Institutions <table border="1" data-bbox="651 734 1026 922"> <tr> <td>2010-2011</td> <td>47</td> <td>7</td> <td>49</td> <td>58</td> <td>38</td> </tr> <tr> <td>2012-2013</td> <td>43</td> <td>5</td> <td>50</td> <td>70</td> <td>52</td> </tr> </table> 2 = Infrastructure <table border="1" data-bbox="651 967 1026 1155"> <tr> <td>2010-2011</td> <td>63</td> <td>6</td> <td>50</td> <td>86</td> <td>54</td> </tr> <tr> <td>2012-2013</td> <td>63</td> <td>5</td> <td>48</td> <td>84</td> <td>59</td> </tr> </table> 3 = Macroeconomic environment <table border="1" data-bbox="651 1245 1026 1433"> <tr> <td>2010-2011</td> <td>43</td> <td>5</td> <td>4</td> <td>73</td> <td>40</td> </tr> <tr> <td>2012-2013</td> <td>69</td> <td>8</td> <td>11</td> <td>99</td> <td>84</td> </tr> </table> 4 = Health and primary education <table border="1" data-bbox="651 1523 1026 1711"> <tr> <td>2010-2011</td> <td>129</td> <td>7</td> <td>37</td> <td>104</td> <td>112</td> </tr> <tr> <td>2012-2013</td> <td>132</td> <td>8</td> <td>35</td> <td>101</td> <td>120</td> </tr> </table>	2010-2011	47	7	49	58	38	2012-2013	43	5	50	70	52	2010-2011	63	6	50	86	54	2012-2013	63	5	48	84	59	2010-2011	43	5	4	73	40	2012-2013	69	8	11	99	84	2010-2011	129	7	37	104	112	2012-2013	132	8	35	101	120	60 %	35 %	5 %
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Transition 1 – 2 (17 countries)																																	
Stage 2. Efficiency-driven – 33 countries (South Africa, China, Namibia fall in this category) <table border="1"> <tr> <td>2010-2011</td> <td>25</td> <td>36</td> <td>2</td> <td>4</td> <td>114</td> </tr> <tr> <td>2012-2013</td> <td>25</td> <td>39</td> <td>2</td> <td>3</td> <td>120</td> </tr> </table>		2010-2011	25	36	2	4	114	2012-2013	25	39	2	3	120	5 = Higher education and training <table border="1"> <tr> <td>2010-2011</td> <td>75</td> <td>4</td> <td>60</td> <td>85</td> <td>111</td> </tr> <tr> <td>2012-2013</td> <td>84</td> <td>3</td> <td>62</td> <td>86</td> <td>119</td> </tr> </table>					2010-2011	75	4	60	85	111	2012-2013	84	3	62	86	119	40 %	50 %	10 %
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		8 = Financial market sophistication <table border="1"> <tr> <td>2010-2011</td> <td>9</td> <td>8</td> <td>57</td> <td>17</td> <td>24</td> </tr> <tr> <td>2012-2013</td> <td>3</td> <td>9</td> <td>54</td> <td>21</td> <td>48</td> </tr> </table>					2010-2011	9	8	57	17	24	2012-2013	3	9	54	21	48															
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Transition 2-3 (21 countries)																																	
Stage 3. Innovation-driven (Switzerland falls in this category) <table border="1"> <tr> <td>2010-2011</td> <td>43</td> <td>2</td> <td>31</td> <td>42</td> <td>92</td> </tr> <tr> <td>2012-2013</td> <td>42</td> <td>1</td> <td>34</td> <td>43</td> <td>35</td> </tr> </table>		2010-2011	43	2	31	42	92	2012-2013	42	1	34	43	35	11 = Business sophistication <table border="1"> <tr> <td>2010-2011</td> <td>38</td> <td>4</td> <td>41</td> <td>44</td> <td>88</td> </tr> <tr> <td>2012-2013</td> <td>38</td> <td>2</td> <td>45</td> <td>40</td> <td>101</td> </tr> </table>					2010-2011	38	4	41	44	88	2012-2013	38	2	45	40	101	20 %	50 %	30 %
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Countries need to be able to sustain higher wages and the associated standard of living only if their businesses are able to compete with new and unique products. At this stage companies must compete through innovation.		12 = Innovation <table border="1"> <tr> <td>2010-2011</td> <td>44</td> <td>2</td> <td>26</td> <td>39</td> <td>96</td> </tr> <tr> <td>2012-2013</td> <td>42</td> <td>1</td> <td>33</td> <td>41</td> <td>101</td> </tr> </table>					2010-2011	44	2	26	39	96	2012-2013	42	1	33	41	101															
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Source: (GCRs 2009–2013).

Extracting and comparing the distinguishing characteristics of the most competitive country, Switzerland, set apart by a brilliant ability to innovate, fortified by a complicated and highly developed business culture, with those of SA, which steadily and continuously profits from the economy's robust size, primarily using provincial measures, the following table of comparison was compiled:

Table 14: Distinguishing characteristics of Switzerland (1st) and SA (54th).

	Switzerland	South Africa
Positive measures:	High company spending on R&D	The large size of its economy
	World's best scientific research institutions	Measures of the quality of institutions
	Strong collaboration between the academic and business sectors ensures that much of this research is translated into marketable products and processes	Factor allocation, such as intellectual property protection
	Strong intellectual property protection	Quality of intellectual property protection, property rights
	Strong innovative capacity that is captured by high rate of patenting (158.95 per million inhabitants)	Goods market efficiency
	Effective and transparent public institutions, ensuring a level playing field and enhancing business confidence	Business sophistication and innovation -benefiting from good scientific research institutions and strong collaboration between universities and the business sector in innovation
	Independent judiciary with a strong rule of law and a highly accountable public sector	Financial market development
	Innovation and labour market efficiency	The accountability of private institutions
	Stable macroeconomic environment	
	Excellent infrastructure, well-functioning goods market and highly developed financial market	
Negative measures:	University enrolment rate of 49.4% - immigration helps to fill gaps, but efforts should be made to boost higher education attainment to ensure sufficient national talent.	Poor labour market efficiency with inflexible hiring and firing practices
		Lack of flexibility in wage determination by companies
		Poor labour-employer relations
		Country's innovative potential could be at risk with a university enrolment rate of only 15 %
		Infrastructure-requires upgrading
		Poor security situation
		Health of the workforce at risk

Source: (GCI 2009–2010, p. 2, p. 38).

SA, being an emerging market, is also an emerging player in the powerful knowledge economy. The country has conducted its economic policy in these turbulent times (2007–2010) in a commendable style, resulting in it displaying a low spread of risk. The economy has been opened up to international trade and capital flow, and has embarked on some costly pioneering social transfer programmes. The SA economy is two-tiered, with one tier competing with other countries that are highly developed, while the other tier competes with countries that largely have only fundamental infrastructure. Despite this, the economy has performed disappointingly when using its GDP as a measure. SA's GDP has, since 1994, grown by, on average, 1.2% per annum (Rodrik 2006, pp. 1-2), and, in 2009, the GDP was 24%, if one includes discouraged workers at 40% (Banerjee *et al.* 2006). The economy of SA is summarised in Table 15.

Table 15: Economy of SA.

Economy of South Africa						
Currency	Rand (ZAR)					
Fiscal year	Calendar year					
Trade organisations	WTO, OECD, G-20, SACU and others					
Social Indicators						
GDP						
Nominal GDP (2012, billions of U.S. dollars) (384)						
GDP per capita (2011, U.S. dollars) (7972)						
Population characteristics (2011)						
Total (50.5)						
Urban population (percent of total) (62)						
Life expectancy at birth (years) (53)						
Poverty						
Headcount ratio at \$1.25 a day (2009, percent of population) (13.8)						
Undernourishment (2011, percent of population) (5.0)						
Income distribution (2009)						
Income share held by highest 10 percent (percent of population) (51.7)						
Income share held by lowest 20 percent (percent of population) (2.7)						
Gini index (63.1)						
National income and prices (annual percentage change unless otherwise indicated)						
	2009	2010	2011	2012 Est.	2013 Projected	2014 Projected
Real GDP	-1.5	3.1	3.5	2.5	2.0	2.9
Real GDP per capita	-2.4	2.3	2.8	1.3	0.8	1.7
Real domestic demand	-1.8	4.5	5.1	3.9	2.4	2.8
GDP deflator	8.3	7.2	6.0	5.5	6.7	6.1
CPI (annual average)	7.1	4.3	5.0	5.7	5.9	5.5
CPI (end of period)	6.3	3.5	6.1	5.6	5.7	5.4
Labor market (annual percentage change unless otherwise indicated)						
Unemployment rate (percent of labor force, annual average)	24.0	24.9	24.9	25.1	26.0	26.2
Average remuneration (formal non-agricultural, nominal)	11.7	13.6	7.2	8.4	8.8	8.1
Labor productivity (formal non-agricultural)	1.7	3.9	1.2	2.0	2.2	2.3
Unit labor costs (formal non-agricultural)	9.9	9.3	5.9	6.3	6.5	5.7
Savings and Investment (percent of GDP unless otherwise indicated)						
Gross national saving	15.5	16.4	16.1	13.2	13.2	13.2
Public (incl. public enterprises)	1.0	-0.5	0.8	-0.1	0.0	0.4
Private	14.5	16.9	15.3	13.2	13.2	12.9

Investment (including inventories)	19.5	19.2	19.5	19.4	19.2	19.3
Public (incl. public enterprises)	8.1	7.1	7.1	7.4	7.6	7.8
Private	13.4	12.2	11.9	11.7	11.6	11.4
Fiscal position (percent of GDP unless otherwise indicated) 1/						
Revenue, including grants	27.4	27.3	28.1	27.9	27.8	27.8
Expenditure and net lending	32.9	32.5	32.1	32.7	32.7	32.5
Overall balance	-5.5	-5.1	-4.0	-4.8	-4.9	-4.7
Gross government debt	31.3	35.8	39.6	42.3	43.0	44.7
Government bond yield (10-years and over, percent) 2/	9.0	8.3	8.5	7.3	7.3	...
Money and credit (annual percentage change unless otherwise indicated)						
Broad money	1.8	6.9	8.3	5.2	8.8	9.2
Credit to the private sector	3.0	3.3	5.7	9.3	8.0	8.4
Repo rate (percent) 2/	7.0	5.5	5.5	5.0	5.0	...
External trade (annual percentage change unless otherwise indicated)						
Merchandise exports (billions of U.S. dollars)		85.4	102.9	93.5	97.3	99.6
percentage change (volume)		4.5	5.9	0.1	5.3	5.2
Merchandise imports (billions of U.S. dollars)		81.7	100.7	102.7	106.2	108.7
percentage change (volume)		9.6	9.7	6.3	5.1	4.2
Terms of trade		7.3	2.3	-2.2	0.4	-1.2
Balance of payments (percent of GDP unless otherwise indicated)						
Current account balance (billions of U.S. dollars)	-11.5	-10.2	-13.6	-24.1	-21.5	-22.7
percent of GDP	-4.0	-2.8	-3.4	-6.3	-6.1	-6.1
Overall balance	0.7	1.2	1.1	0.3	0.0	0.0
Gross reserves (billions of U.S. dollars)	39.7	43.8	48.9	50.7	50.7	50.7
percent of short-term debt (residual maturity)	136.8	145.8	151.6	133.2	133.2	132.9
Total external debt	27.5	28.8	28.1	35.8	35.0	35.5
of which short-term (residual maturity)	10.2	8.3	8.0	9.9	10.8	10.3
Nominal effective exchange rate (percentage change) 3/	23.7	11.3	-16.6	-5.4	-11.7	...
Real effective exchange rate (percentage change) 3/	29.3	12.2	-14.1	-2.3	-8.2	...
Exchange rate (Rand/U.S. dollar) 2/	7.4	6.6	8.1	8.5	10.1	...
Levels of Education	The proportion of persons who completed secondary education (matric) or higher increased from 23,4% in 1996 to 40,5% in 2011					
Main industries	Mining (world's largest producer of platinum, gold, chromium), automobile assembly, metalworking, machinery, textiles, iron and steel, chemicals, fertilizer, foodstuffs, commercial ship repair					

Source: (IMF Country Report No. 13/303 2013).

In SA, the National System of Innovation (NSI) (Anon, 2013) can roughly be described as a network of interacting country players and serves as inspiration for the South African government's broad socioeconomic mandate of fast-tracking and maintaining economic growth. It acknowledges the enormous gap between SA and other knowledge-driven economies, and, in addressing this gap, the focus is on long-term aims. This includes challenging SA's failure to commercialise the outcome of scientific research, as well as its failure to produce competent knowledge workers (qualitatively and quantitatively) in encouraging an internationally competitive economy. The South African strategy regarding innovation tries to actively promote the realisation of the nation's national objectives, in alignment with the millennium goals (SA 2007). The focus of the millennium goals is to step up economic development by stimulating the use of technology. For SA to uphold its competitive standing, it should adhere to a three-tier approach:

- satisfy trading requirements by importing technology and gaining admittance to external technology sources;
- create global connections with manufacturing systems; and
- guarantee technology transfer by contemplating co-operation agreements with international expertise.

SA will achieve the growth-related mandate of the government if it continues to alter the ratio of national income as a result of knowledge-based businesses, the proportion of people engaged in knowledge-based professions, as well as the percentage of organisations innovating and utilising technology. Human capital advancement, together with knowledge infrastructure, guides the progression to an economy based on knowledge. In such an economy, knowledge production and utilisation (R&D) is vital, on condition that the discourse on the “innovation chasm” between research findings and socioeconomics is addressed. Statistics regarding the number of researchers in SA is reflected in Table 16.

Table 16: Researchers in SA.

Researchers in South Africa, 2007 or most recent year available	
Total number of researchers (FTE)	18 574.0
Share of woman researchers (%)	39.7
Researchers per million inhabitants (FTE)	382.0
Technicians per million inhabitants (FTE)	130.0
Researchers by sector (FTE)	
• Business enterprise	6 111.0
• Government	2 768.0
• Higher education	9491.0
• Private non-profit	204.0

Source: (Urama *et al.* 2010, p. 284).

SSA’s contribution to global research output increased from 0.44% in 2003 to 0.72% in 2012, signifying a reversal of the trend reported in 2007, that Africa’s contribution to worldwide research was declining. However, SSA still accounts for less than 1 percent of the world’s research output, still less than its share of global population at 12 percent (A decade of development In Sub-Saharan African. Science, technology, engineering and

mathematics research. 2014, p. 3). The research outputs and citation impact of Sub-Saharan Africa is given in Table 17.

Table 17: Research outputs and citation impact.

<p>PUBLICATION OUTPUT GROWTH 2003-2012</p> <p>>100%</p> <p>All SSA regions more than doubled their yearly research output.</p>	<p>SUBJECT AREA OUTPUT IN 2012</p> <p>28.5%</p> <p>On average for the three SSA regions, research in the Physical Sciences & STEM constituted 28.5% of their total output. In contrast, the average share of Health Sciences for the three regions was 45.2%.</p>
<p>HIGHLY CITED ARTICLES IN 2012</p> <p>7.5%-16%</p> <p>Between 7.5% and 16% of the different SSA regions' total outputs were amongst the world's top 10% most highly cited articles, but only 5.9% -10% of those same regions' total output in the Physical Sciences & STEM met that threshold.</p>	<p>FIELD-WEIGHTED CITATION IMPACT (FWCI)</p> <p>0.92</p> <p>Research output across the three SSA regions achieved a FWCI of 0.92 in 2012, meaning it was cited 8% less than the world average. However, the regions' average FWCI in the Physical Sciences & STEM was only 0.68 in 2012, and it has virtually stayed the same since 2003.</p>

Source: (A decade of development In Sub-Saharan African Science, technology, engineering and mathematics research. 2014, p. 14).

Two-thirds of South African periodicals are linked to life sciences, while the rest are relatively evenly spread amongst the fields of science, incorporating chemistry, mathematics, and physics (Urama *et al.* 2010, p. 285). The indicators used to measure whether the NSI's goals have been achieved are depicted in Table 18.

Table 18: Indicators to measure achievement of NSI goals.

Indicator	Measure	2018
SA positioned as knowledge-based economy	Economic growth attributable to technical progress (10% in 2002)	30%
	National income derived from knowledge-based industries	>50%
	Proportion of workforce employed in knowledge-based jobs	>50%
	Proportion of firms using technology to innovate	>50%
	GERD/GDP (0.87 in 2004; short-term 2008 target was 1%)	2%
	Global share of research outputs (0.5% in 2002)	1%
	High- and medium-tech exports/services as a percentage of all exports/services (30% in 2002)	55%
	Number of South African-originated US patents (100 in 2002)	250
Research and technology enablers	Matriculants with university exemption in maths and science (3.4% in 2002)	9%
	SET tertiary students as percentage of all tertiary students	30%
	Number of PhD graduates per year (963 in 2002)	2 200
	Gross availability of SET graduates to economy (235 438 in 2002)	450 000
	Number of full-time equivalent researchers (was 8 708 in 2002)	20 000
	Total researchers per 1000 people employed	5%

Source: (NSI 2011).

Innovations, such as the introduction of new or significantly improved goods or services, or the use of new or significantly improved processes, are necessary to ensure the future sustainability and competitiveness of organisations in this progressively competitive global economy. SA's Department of Science and Technology launched a ten-year innovation plan for 2008 to 2018: *Innovation towards a knowledge-based economy*. The Centre for Science, Technology and Innovation Indicators (CeSTII) conducted a series of official South African Innovation Surveys in an effort to establish a baseline set of indicators in support of SA's National Research and Development Strategy. Based on the results of the survey, the innovation rate of SA is depicted in the table below.

Table 19: Innovation rate: Percentages of innovative and non-innovative enterprises in SA, 2002–2004.

	% Total	% Industry	% Services
Enterprises with innovation activity	51.7 (EU = 42%)	54.8 (EU = 41.5%)	49.3 (EU = 37%)
Product-only innovators	11.9	10.9	12.7
Process-only innovators	5.7	3.8	7.3
Product and process innovators	29.7	38.1	22.9
Enterprises with only on-going or abandoned activities	4.4	2.0	6.3
Enterprises without innovation activity	48.3	45.2	50.7
Industry = mining and quarrying, manufacturing, electricity, gas and water supply Services = wholesale and retail, transport, storage and communication, financial and intermediation, computer and related services, R&D services, architectural and engineering and technical testing)			

Source: (Human Sciences Research Council 2009, p. 9).

(South African National Innovation Survey).

The results of the SA Innovation Survey revealed the engagement of local organisations with the notion of innovation. These organisations compared well with organisations in many European countries, indicating that SA could take on board the European Union (UN) policies for supporting innovation, and does not have to do things differently. Being innovative attracts and retains highly qualified people (Blankley & Moses 2009, pp. 15-17).

The SA Innovation Survey of 2005 comprised a random stratified sample by sector and size of enterprise. This sample was drawn from the business registry database of Statistics SA. The response rate to the survey was 37.3% (the sample consisted of 2 627 organisations). The results of the survey were extrapolated to the target business population of 31 456 organisations, based on the weights of 120 strata. Some of the results were:

- The proportion of innovative SA organisations undertaking intramural research and experimental development (R&D) was 51.7% (tenth out of 24 countries, while the EU's average was 52.2%).

- In SA, 54.8% of organisations in the industrial sector were innovative, compared to 49.3% in the services sector. The management of innovation in the manufacturing industry has always featured as a concern.

In SA, Australia, and the EU (then consisting of 27 countries (EU-27)), services accounted for just over 70% of their GDPs. When comparing SA's industrial sector to the services sector, the greater number of enterprises in the services sector had resulted in 53% of all innovative organisations being in the services sector and 47% in industry, although the services sector does not have much of an innovation legacy.

The organisations that reported innovation activities as a percentage of all organisations in industry and services for 2002/4 are reflected in Figure 2.

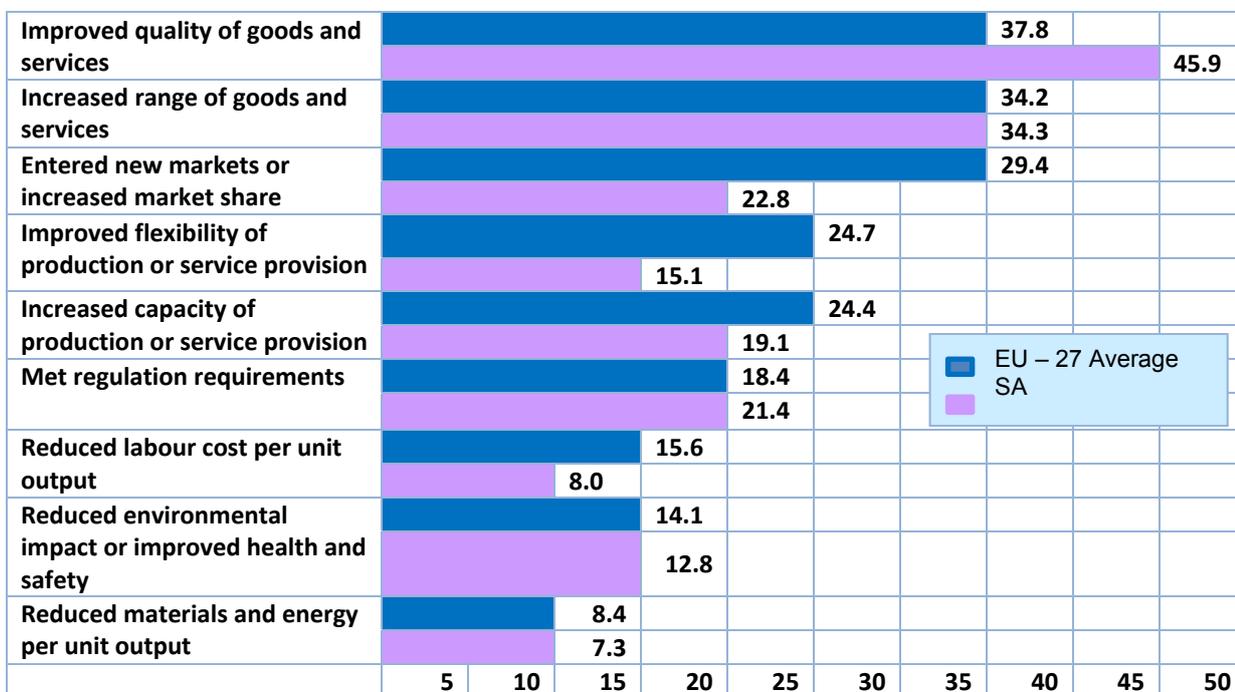


Figure 2: South Africa's innovation activities 2002–2004.

Source: (All data except for SA are estimates from European Communities 2007, p. 4).

Innovative enterprises spent approximately R28 billion on innovation activities. Cost related to innovation undertakings as a percentage of the gross revenue of innovative enterprises was 3.2%. This is reflected by sector in the table below.

Table 20: South African Innovation expenditure by innovative enterprises, 2002–2004.

	Services enterprises	Industrial enterprises
Innovation expenditure	3.6%	2.9%

Source: (Human Sciences Research Council 2009, p. 9).

(South African National Innovation Survey).

Most of this innovation expenditure was to obtain new equipment, machinery, and software, and was equivalent to 1.58% of the turnover of all enterprises and 2.1% of the turnover of innovative enterprises. More than 21% of innovative enterprises in SA reported that their innovation activity was undertaken in order to comply with government regulatory requirements. Government should accept responsibility for creating an enabling environment for innovation, rather than trying to boost innovation through funding programmes. Innovative organisations employed more staff than non-innovative organisations, which accounted for 78% of total employees. These employment numbers are indicated in Table 21.

Table 21: Number of employees in South African organisations with and without innovation activity, 2002–2004.

Size class	1	2	3	4	Total
All Organisations: number of employees (thousands)	1060	312	298	100	1 771
Organisations with innovation activities (% employees)	87.2%	68.4%	68.1%	70.7%	78.0%
Organisations without innovation activities (% employees)	12.8%	41.4%	31.9%	29.3%	22.0%

Source: (Human Sciences Research Council 2009, p. 9).

(South African National Innovation Survey).

To understand the significance of these figures and the impact of organisations with innovation activities, it is necessary to consider the key labour market indicators, as given in Table 22.

Table 22: Key labour market indicators.

	Jan-Mar 2012	Oct-Dec 2012	Jan-Mar 2011	Qrt-to-Qrt change	Year-on-year change	Qrt-to-Qrt change	Year-on-year change
	Thousands			Percent			
Population 15–64 yrs	32 786	33 128	33 240	112	454	0,3	1,4
Labour force	17 948	18 078	18 222	144	274	0,8	1,5
Employed	13 422	13 577	13 621	44	199	0,3	1,5
Formal sector (non-agricultural)	9 509	9 611	9 586	-25	77	-0,3	0,8
Informal sector (non-agricultural)	2 106	2 205	2 192	-13	86	-0,6	4,1
Agriculture	656	685	739	54	83	7,9	12,7
Private households	1 151	1 076	1 105	29	-46	2,7	-4,0
Unemployed	4 526	4 501	4 601	100	75	2,2	1,7
Not economically active	14 838	15 050	15 017	-33	179	-0,2	1,2
Discouraged work-seekers	2 335	2 257	2 330	73	-5	3,2	-0,2
Other (not economically active)	12 503	12 794	12 688	-106	185	-0,8	1,5
Rates (%)	25,2	24,9	25,2	0,3	0,0		
Unemployment rate							
Employed/population ratio (absorption)	40,9	41,0	41,0	0,0	0,1		
Labour force participation rate	54,7	54,6	54,8	0,2	0,1		

Source: (Statistics SA 2014, p. 10).

(Quarterly labour force survey).

Table 23: Additional South African labour market indicators: Quarter 4, 2012, and Quarter 1, 2013.

Increased	By	To
Employment	44 000	13,6 million
Unemployment	100 000	4,6 million (rate = 25,2%)
Discouraged work seekers	73 000	2,3 million
Decreased		
Not economically active	106 000	
Number of unemployed reached 4,6 million in Q1:2013 of which 65,3% have been looking for work for a period of 1 year or longer. 59,4% of the job seekers did not have matric.		
The unemployment rate amongst the 15–24 year-olds (52.9%) remains the highest among all age groups and has been on the increase. The 15–34 year-olds accounted for 70.7% of the unemployed persons.		

Source: (Statistics SA 2013, pp. 1-10).

The higher education profile of organisations according to the Innovation Survey is provided in the table below.

Table 24: Number and percentage of South African employees with a degree or diploma, 2002–2004.

	Total				Industry				Services			
	Total number of staff											
Size classes	1	2	3	4	1	2	3	4	1	2	3	4
Enterprises with innovation activity	832,194	183,930	203,060	70,973	462,727	123,607	116,254	66,642	369,466	60,323	86,807	4,330
Enterprises with no innovation activity	114,020	126,497	95,123	29,415	55,132	88,239	55,416	18,252	58,888	38,258	39,707	11,163
	Total number of staff with degree or diploma											
Size classes	1	2	3	4	1	2	3	4	1	2	3	4
Enterprises with innovation activity	133,769	13,980	19,969	11,354	84,026	8,446	8,529	10,267	49,744	5,534	11,440	1,087
Enterprises with no innovation activity	10,089	4,077	8,271	8,535	3,963	2,586	1,168	2,639	6,127	1,491	7,103	5,896
	Percentage of staff with degree or diploma											
Size classes	1	2	3	4	1	2	3	4	1	2	3	4
Enterprises with innovation activity	16.1	7.6	9.8	16.0	18.2	6.8	7.3	15.4	13.5	9.2	13.2	25.1
Enterprises with no innovation activity	8.8	3.2	8.7	29.0	7.2	2.9	2.1	14.5	10.4	3.9	17.9	52.8

Source: (Human Sciences Research Council 2009, p. 9).

(South African National Innovation Survey).

Interpreting these results, the following can be deduced: SA spends approximately R28 billion on innovations, which equates to 3.2% of the turnover of innovative organisations. If 51.7% of organisations have innovative activities, and they employ 87.2% of employees, of which only 13.88% across all size classes have higher education qualifications, it is clear why knowledge factors are seen as an impediment to innovation. The key factors that hamper innovation activities in the industrial and services sector have been identified as:

- cost factors —
 - the absence of reserves within the organisation/group (25.3%*),
(* = total including all enterprises, industry, and services)
 - the absence of reserves from outside the organisation (15.4%), and
 - innovation costs are too high (20.4%);

- knowledge factors —
 - the absence of qualified personnel (17%),
 - a deficiency of information on technology (4.3%),
 - a deficiency of market intelligence (3.8%), and
 - difficulty in locating collaboration partners (8.1%);
- market factors —
 - markets are dominated by established organisations (26.2%), and
 - a doubtful demand for innovative goods and services (9.9%);
- reasons not to innovate —
 - no requirement as a result of previous innovations (4.1%), and
 - no demand for innovations (9%).

(Human Sciences Research Council 2009, p. 42).

(South African National Innovation Survey).

Daniels (2007, p. 1) contributed by stating that a deficit of knowledge factors was identified by 33.2% of all enterprises as debilitating to innovation activities. These skills shortages can be described as a nebulous concept, describing the shortfall between demand and supply of certain skills. According to Daniels, such shortages are ubiquitous, even though the specifics vary between sectors and organisation sizes. This very simplistic definition encapsulates many specific components, and can graphically be depicted as follows:

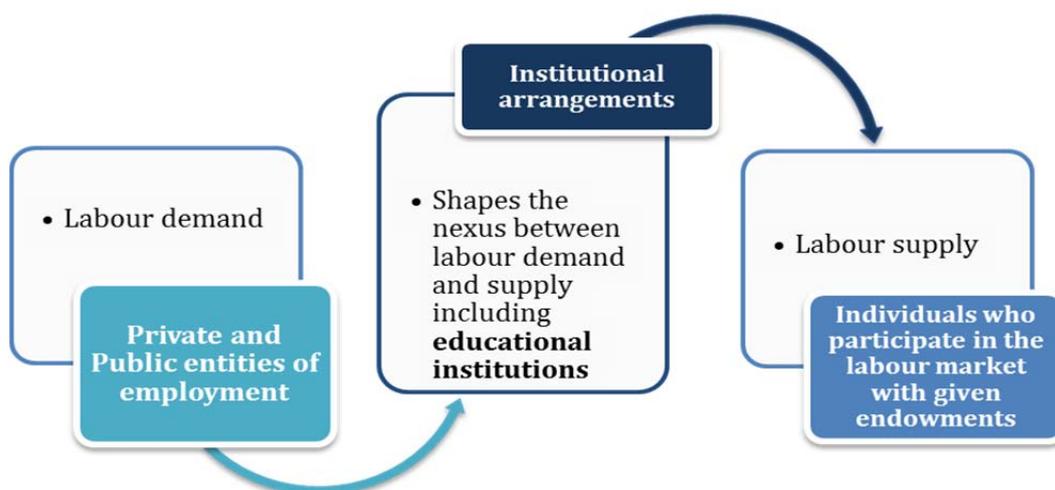


Figure 3: A graphic depicting the discourse on labour economics.

Source: (Adapted from Daniels 2007, p. 1).

The discourse on labour economics within the South African context will be explored by considering the current profile of the labour force and the responsibility of the skills development agencies, including educational institutions, to address the knowledge factors needed to take the country forward.

Morrison (2007, p. 2) identified that the main elements of competitiveness and growth of groupings, big and small, including organisations, are learning and innovation. Competitiveness is shaped by unique organisational stances and actions, as well as the macroeconomic surroundings in which the organisation is situated. Foregrounding human resource development as a mechanism that can lead to unequalled economic performance can contribute to the development of a proficiently skilled labour force across all levels of the economy.

1.3 HUMAN RESOURCES ON A STRATEGIC LEVEL

Randolph (2006, pp. 1085-1086) posits that open collaborative business processes are taking root in the global economy, and that service innovation is emerging as an increasingly important pillar of economic growth and value. The author further argues that changing patterns of global economic activity are challenging existing policies and business strategies, which requires a globally competitive workforce. Makgoba (2010, pp. 69-71) added that such a development strategy needs to be supported by appropriate human resource policies and practices, to harness the talents of people and to build a pool of sustainable competence that can lead to greater productivity and resilience, as well as the achievement of national goals.

Bloom *et al.* (2006, pp. 5-13) and Britz *et al.* (2006, p. 29) reasoned that, in order to engage with issues related to human resource development, leading to the promotion of a knowledge-based society, Southern Africa's, and particularly SA's, commitment to initiate or address the following issues needs to be emphasised:

- defining the value of knowledge;
- developing advanced knowledge and decision-making skills within the economic and institutional system ;

- instituting poverty reduction strategies through human capacity building;
- improving environmental facets, for example, infrastructure and security against internal and external threats;
- financing ICT and connectivity;
- pursuing virtuous governance; and
- focusing on innovation and entrepreneurial development.

Bloom added that, within a modern knowledge economy, any economic policy needs to have an impact on the performance and competitiveness of a country, and acknowledge the relationship between knowledge investment, innovation, and competitiveness. Van Hemert and Nijkamp (2010, pp. 369-384) also found that investment in private and public research and development ought to be complemented by expenditure on human capital as the major ingredient in the knowledge construction process. The focal point of this process is knowledge, which is viewed as the 'key factor of production' for economic growth (UN Conference on Trade and Development, 2007). The old neoclassical theory had at its core the production function, formulating the productivity of the economy as dependent on the measure of production factors used (land, labour, capital, materials, and energy).

Godin (2006, p. 3) reasoned that the knowledge foundation is another factor of production in the new growth theory that was advanced by economists such as Romer, Grossman, Helpman, and Lipsey. Conventional production factors, for instance, land, labour, and capital, do not explain the on-going growth costs of Western economies. Rosenberg (1976) quoted Abramowitz (1956) and the OECD (1964) by contextualising the 'excess' that had to be clarified, by and large, by the role of knowledge in the economy, which takes account of the promotion of the work force. The economic importance of nurturing the knowledge potential of the country cannot be disputed; this conceptual link between higher education and economic growth is illustrated in Figure 4, below.

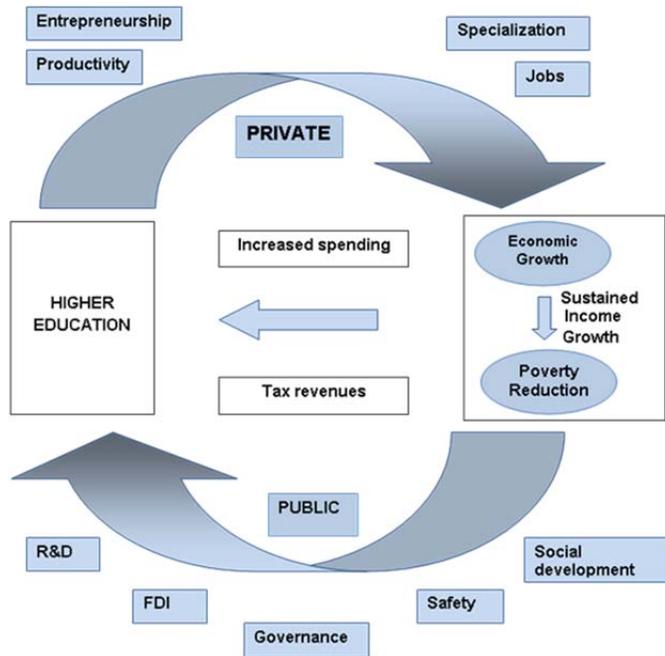


Figure 4: Conceptual connection between HE and economic growth.

Source: (Adapted from HE and Economic Development in Africa 2006, p. 16).

Higher Education (HE) has attracted much state attention. State endeavours and exertion of power are typified by their expectation that HE will:

- generate knowledge, which underpins economic development;
- successfully supply the employees and customers on whom economic development depends; and
- embody key domains of profitable business opportunities in a globalised HE environment.

HE needs to strengthen and preserve the growth-orientated knowledge economy (Boden & Nedeva, 2010).

Neave (2000, p. 2) stated that there is a markedly 'public' feature to society, which is epitomised in higher education institutions (HEIs). This is described by society through laws and government. In order to deliver on this public responsibility, HEIs traditionally received government funding, together with a corresponding dimension of institutional and academic independence. The author added that social responsibility is closely scrutinised, and the HE functions of teaching and research are reviewed in terms of the contribution they make to the socio-economic welfare of their environment (region, country, and internationally). According to Jongbloed *et al.* (2008, pp. 305-306), the

social agreement involving HEIs, science, and the state has been modified through excellent education and research that is delivered using methods and quantities that address aspects of the knowledge society. This amendment to the social contract between HEIs, science, and the state has created more precise expectations (Neave 2006; Guston & Keniston 1994; Demeritt 2000; Morley 2001; Boden & Epstein 2006).

Neoliberalism has dramatically influenced this social contract by massification of HE and increasingly making it more business and market orientated (Wilmott 1995; Shore & Wright 2000). An important argument for widening access to HE is societal fairness by offering access to HE opportunities and delivering employees who can successfully compete in the worldwide knowledge economy. A major function of universities in this respect is to produce an appropriately trained workforce, matching employers' requirements. The contribution of HEIs to the development of populations' knowledge and skills has been labelled 'employability'. This implies that the knowledge, skills, and entrepreneurial eagerness of employees encourage the economic well-being of persons and the competitive advantage of nations (Williams, Hesketh & Brown 2003, p. 122; Boden & Nedeva 2010).

Both government and universities have implemented policies to foster academic production, diffusion, and commercialisation. Universities as drivers of economic growth in the learning society are increasingly included in public policies that aim to foster innovation in the face of mounting societal demands and financial strain due to shrinking public budgets. The management of knowledge production at universities has been strengthened in order to monitor, evaluate, and enhance knowledge production while accounting for spending efficiency and performance — typical features of the 'evaluative state' (Neave 1998, p. 8). The logic of knowledge commercialisation, fostered by governments and university administrators via research commercialisation policies, has become institutionalised through the establishment of technology transfer offices, hiring intellectual property (IP) officers, implementing internal procedures regarding IP rights and licensing, and creating ecosystems for venture capitalists (Geiger & SA 2008).

Given that knowledge is perceived as an increasingly important asset in assuring society's well-being and in driving economies forward, the following issues were identified in the literature:

- the changing national science policies and their influence on knowledge management in universities; and
- the impact of policies and organisational characteristics on academic knowledge production, diffusion, and commercialisation.

Knowledge is accumulated, but, in its generation, new knowledge replaces knowledge that has become less relevant, emphasising the significance of the learning process (Lundvall 2009). Table 25 describes studies and findings related to science policy and research production, diffusion, and commercialisation.

Table 25: Science policy and research production, diffusion, and commercialisation.

Researcher	Focus of study	Findings of study
Sa and Litwin (2009)	Studies how science policies to promote knowledge commercialisation have evolved and how universities have responded to them, adapted their practices and designed their own to foster them at the organisational level.	Canadian Federal Government has used an increasing variety of policy tools to foster university-industry linkages
Leisyte (2009)	Comparative analysis between the Dutch and the US national innovative systems and how the Dutch and the US governments have attempted to bolster research commercialisation in their respective systems and regulation and funding policy mechanisms have been used by universities to institutionalise university-industry linkages.	Despite the differences in the traditional research governance models, the incentive schemes used in the two countries share several similarities indicating policy-borrowing and institutional isomorphism
Leisyte (2011)	To grasp the complexity of resources shaping knowledge production and diffusion, two further studies focus on the determination of knowledge productivity	It is necessary for deepening the understanding of the mechanisms that foster or hamper academic knowledge production and diffusion. This change with time with changes in the nature of learning, and the source from which one learns.
Horta and Lacy (2008)	Analyse how individual and organisational characteristics (especially the size of the research unit), affect the research productivity and the information exchange patterns of academic scientists in Portugal	Organisation size and structure are important in fostering communication among peers. Organisational size does not lead to a greater research output, but to different research output profiles.
Haung et al (2009)	Analyses focus on patenting by academics and engineers in the USA.	They find that department incentives, individual preferences and characteristics predict the patent productivity of academics. Found that university patent policy and technology transfer offices play a role in the academics' first-time patenting.
Kitagawa et al (2011)	Study how academic work has been changing towards the diversification of tasks and to what extent these are compatible	Provides evidence from Sweden by exploring the changing nature of academic work and its diversifying activities, focusing on the involvement of scientists in commercialisation and public dissemination activities. They analyse 'high-performing' researchers based in Sweden and argue that there is a strong, virtuous, cyclical model connecting different academic activities
Ki-Seok Kwon(2011)	Analyses the relationship between universities' academic research and knowledge transfer activities in South Korea.	Publishing and patenting activities and the industrial structure co-evolved closely throughout time. The role of public science policies is identified as key in shifting university-industry cooperation from traditional to high-tech industry, and in promoting a greater interaction in terms of publishing and patenting between public research institutes, university and industry

Source: (Leisyte & Horta 2011, 423-424).

Systemic, relevant, and actionable learning can be a lever in developing a culture of innovation and capability. According to Sheppard and Canning (2006, p. 18), individuals need education that is designed to connect to their broader context, that is concentrated on their most pressing challenges, and that encourages them to connect with their innovation efforts. HE should produce graduates with sought-after attributes, who can enter the workplace in specialised jobs and be competitive. There needs to be alignment between what universities produce and what is needed by business. Some graduates may also act as entrepreneurs and create jobs for others. Graduates generally earn higher salaries (News release, Office for National Statistics UK, 2011), and therefore contribute more to taxes; they also have higher spending potential, which adds to the coffers of government for social development and poverty reduction, (interpretation from the Triple Helix Model, Fig 4, pp. 53).

According to Liu and Zhi (2010), government spending on innovation is one of the drivers of productivity. It can be used to structure evaluation of the manner in which policy can intensify productivity. The efficiency of such policy is reflected in the innovation systems, through their ability to produce innovation that can be transformed into economic progress. Government creates the governance framework for business to operate in, and sets policy and national strategies for development and competition. Public policies as instruments that emphasise research priority-setting, research evaluation, and performance-based funding have been increasingly prioritising certain areas of knowledge under the banner of building research capacity, visibility, and relevance (Liu & Zhi 2010). Research governance has become a complex, multi-layered, multi-level, and multi-actor endeavour (De Boer *et al.* 2008), and science policies have also become multifaceted, often combined with HE- and economic policies, to allow for broader systemic impacts and synergies (Clarke 2010). These policies emphasise the third mission of the university.

HEIs and government both participate in research and development, but with different focus areas. As can be deduced from Figure 4 (p. 53), the common denominator that influences these three areas is human resource capital. Universities were traditionally tasked with education and research, but a new task has been added, that of knowledge

transfer (community outreach), which includes generating, sharing, and applying knowledge, for the prosperity and well-being of the people. Universities are confronted with original challenges and opportunities in the knowledge society, including developing into an affiliate and acting within dynamic innovation networks. A systemic view of the different environments — higher education, government, and industry — highlights the intricate dynamics, as described in the Triple Helix Model (Fig 4, p. 53).

The relationship between university, industry, and government (Triple Helix Model Fig 4, p. 53) is a complex dynamic. Industry (working towards wealth creation), academia (working towards novelty production), and government (tasked with public control) interact. Leydesdorff and Meyer (2006, pp. 1-3) suggests that this interaction results in tenuous equilibria between differentiation and integration amongst the different functions. The authors further commented on the eroding of institutional boundaries between commerce, government, and HE as they strive towards the goal of helping citizens, organisations, and governments to understand and manage the information society's learning challenges.

Laine *et al.* (2008, pp. 64-65) pointed out that individuals are faced with new challenges and continuous changes in their jobs. New competencies are required, acquired through adaptation and learning. The strength that the university and its external partners bring to the relationship is the co-creating link. HE is afforded the opportunity and freedom to deliberate 'the unthinkable'. On the other hand, in the community and in business, time is of the essence, and, therefore, people need to confirm the possible and reject the improbable. To enable sustainable success, both sides need to function in a trans-disciplinary manner, co-creating innovative and profitable technologies and products, as well as processes that empower and operate in composite ecosystems.

Tertiary education can serve as a catalyst in improving economic growth with its embedded advantages (e.g., employment creation, higher living standards, and eventual wealth). Therefore, HE needs to address the developmental needs of the country, while also attending to global competitiveness. Though HE has no discernible end-products, it is an on-going transformative process that delivers impact, long after any formal

programme has been completed (Harvey 1995). It contributes to the development of intellectual capital, and plays an integral role in producing both public and private benefit. Private benefit is accrued in the form of better employment prospects, leading to higher levels of wealth and, consequently, living standards. This includes fostering innovative capabilities, leading to a more entrepreneurial and civic society. Public benefit is derived from enhanced economic development through gaining ground on more technologically advanced societies and strengthening governance (Bloom *et al.* 2006).

In the next section SA's labour market dynamics is discussed.

1.4 SA's EDUCATION–ECONOMY RELATIONSHIP

In advancing the acquisition of multi-functional skills capabilities, vocational and career-oriented training needs to build on high levels of general education. Kraak (2005, pp. 57-58) posited that globalisation requires workers in unstable markets to be able to swiftly attune to changing conditions and acquire multi-functional competencies, so that they can become involved in diverse enterprise activities. Industrial policy in SA has a different trajectory than that of increasing knowledge intensity in production and manufacturing export-orientated products. SA has historically been an economy dependant on natural resources and the country embraced import-substituting industrialisation policies aimed at developing a robust domestic industrial base.

Table 15 (p. 40) displays SA's high unemployment rate, which highlights the concern of the country's poor economic performance (24%–26% unemployment from 2009–2014). Given that SA performs poorly economically, and that the second-highest problematic factor impacting on SA business is an inadequately educated workforce (proportion of persons who completed secondary education (matric) or higher was 40.5% in 2011 - see Table 15, p. 40), the multiplying effect of graduates with appropriate attributes is essential for the country's economy to sustain itself. The SA government's expenditure needs to differentiate between reducing consumption and increasing investment in infrastructure, technology capacity, capital goods, and education, to grow the economy through original productive capacity (Mapuva 2010, pp. 400-403).

However, problematic factors for doing business were identified, as depicted in Figure 5; an inadequately educated workforce was ranked second.

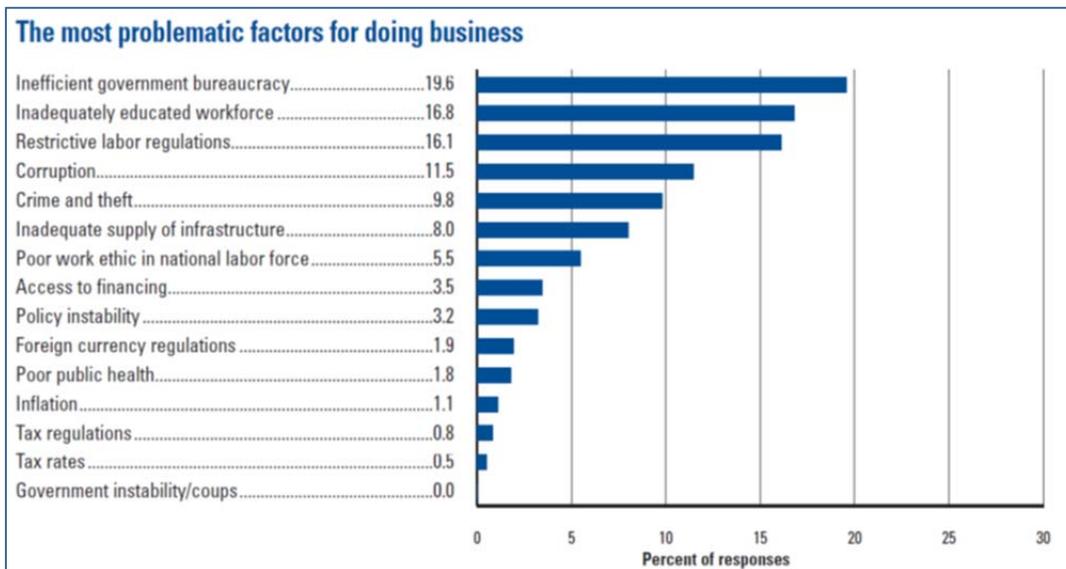


Figure 5: Factors impacting SA business.

Source: (<http://www.southafrica.info/business/economy/competitiveness-310512.htm>).

Additionally, the South African human-resource deficit is influenced by a significant human capital flight, resulting in the loss of graduates — 25% to the USA alone (Quarterly Labour Force Survey, Statistics SA 2008). The South African Bureau of Statistics estimated that 1 million to 1.6 million competent, qualified professionals have emigrated since 1994. These emigrations have also resulted in the loss of jobs of unskilled people at a ratio of 1:10. The belief that the importance of the quality of jobs is equivalent to that of the number of jobs has gained prevalence in recent years (Quarterly Labour Force Survey, Statistics SA 2008). Table 26 gives labour market statistics for SA relating to formal and informal employment by occupation.

Table 26: Formal and informal employment by occupation Apr–Jun 2008.

Occupation	Formal Thousand	Informal Thousand	Formal %	Informal %
Manager	588	100	7.2	2.0
Professional	638	55	7.8	1.1
Technician	1205	183	14.8	3.7
Clerks	1275	164	15.6	3.3
Sales & service	1074	624	13.2	12.7
Skilled agriculture	32	33	0.4	0.7
Craft	1083	811	13.3	16.5
Machine operator	842	306	10.3	6.2
Elementary	1419	1686	17.4	34.3
Domestic worker	0	952	0	19.4
Other	2	0	0	0
Total	8157	4915	100	100

Source: (Labour market dynamics in SA, Stats SA 2013, p. 5-7).

To further complicate matters, SA displays a distinct variation in the educational profiles of people in the informal and the formal employment sectors. According to Statistics SA (Quarterly Labour Force Survey 2008, p. 5), some of the marked differences in the educational profile between the two sectors are the following:

- In informal employment, 8.4% have no education, 70,9% have qualifications below Grade 12; and 2.9% have a tertiary education;
- In formal employment, 2% have no schooling, 38% have qualifications below Grade 12, and 23.3% have a tertiary education.

These differences are depicted in the table below.

Table 27: Formal and informal employment's educational profiles.

Sector	None	Less than matriculation	Matriculation	Tertiary	Other
Formal	2.0	38.0	35.4	23.3	1.2
Informal	8.4	70.9	16.3	2.9	1.4

Source: (Quarterly Labour Force Survey, Statistics SA 2008).

The skills deficit impasse continues to be a factor contributing to the organisational restrictions in the country's growth and development. In addressing these skills challenges, one needs to understand the current demands and anatomy of the South African labour force. The human resource skills demands of the country are reflected in

the country's national Scarce Skills List, published by the Department of Labour. The list represents an increasing coherence across economic sector players and government, and emphasises a move away from an unskilled labour force to a highly skilled labour force, to enhance the economic sophistication of the country. Skills from the National scarce skills lists for 2006 and 2008 are given in Table 28.

Table 28: Skills by occupational category according to the National Scarce Skills Lists for 2006 and 2008.

Occupational category	Number of positions	
	2006	2008
Managers	57 865	41 585
Professionals	106 455	145 780
Technicians and Trades workers	41 050	113 035
Community and Personal service workers	--	167 620
Clerical and administrative workers	--	53 850
Sales workers	--	25 780
Machinery Operators and Drivers	--	42 580
Elementary workers	--	33 345
Total magnitude of scarcity	205 370	623 575

Source: (National Scarce Skills Lists 2006; 2008).

The above scarce skills are further analysed by occupation and organisation size, which highlights a clear underrepresentation in the highly skilled occupations of historically disadvantaged individuals. These analyses are given in Table 29.

Table 29: Scarce occupations by organisation size, World Bank Large Manufacturing Organisation Survey, 1999.

Occupational / Size Class	50-99 Workers	100-199 Workers	200+ Workers	Total
Managers	70.55	81.82	90.43	79.27
Professionals & Technicians	71.23	81.82	90.43	79.57
Clerks	34.25	29.55	32.98	32.62
Sales and Service	50.00	64.77	71.28	60.06
Craft	51.37	64.77	72.34	60.98
Operators	36.99	47.73	43.62	41.77
Labourers	4.11	7.95	3.19	4.88

Source: (Bhorat & Lundall 2002, p. 17).

Surveys and skills assessments done during 2005 and 2006 (National Enterprise Survey (NES), the World Bank Large Manufacturing Organisation Survey, the World Bank Small, Medium and Micro Enterprises Survey (WBSMMES), and surveys by the Human Sciences Research Council (HSRC)) have consistently identified the management echelon as the occupation with the lowest supply of needed skills. The skills that were the most critical in this category were identified by organisations as:

- people and staff management;
- general leadership dynamics and management;
- sales and marketing;
- budgeting, finance, and entrepreneurial skills;
- general communication skills; and
- managerial diversity.

The ability to provide training across the management spectrum is complex, as the training is less defined and not confined to one discipline (Daniels 2007, p. 19).

Roderik (2006, p. 781) recognised certain propensities in the South African economy that collectively restrain the demand for low-skilled workers:

- each economic activity has been substituted with skilled workers;

- through structural changes, there has been a move away from the lowest skill-intense parts of the economy; and
- within the lowest skill-intense area, production techniques have increased in capital intensity.

The transfer of the demand to skilled workers explains why unemployment has drifted upwards. The misalignment between educational output and economic needs puts pressure on SA to train more people, more effectively and to higher quality standards, in order to promote its ability to compete in the global community.

Although SA spends an impressive amount on education — about 5.3% of its GDP and 20% of total state expenditure, according to the Department of Education, it was placed last in 2001 in the Trends in International Mathematics and Science Study (TIMSS), and last in 2006 in the Progress in International Reading Literacy Study (PIRLS). The country's educational policy is shaped around access and equity, but is shifting to include articulation, coherence, and differentiation (through institutional and programme mix).

Human resource development requires a multi-faceted skills strategy and globally competitive and focused industrial policies. The aim is to intensify manufacturing for the export market by adding value to products and services. Such measures include: enlarging SA's foundation in science, combating and turning around emigration of highly skilled people, and increasing the number of suitably educated highly skilled graduates. Supply-side concerns are addressed by either enterprise education and training initiatives or secondary and tertiary education and training initiatives. With regard to the association between organisational output and employment, capital and training research shows that a 1% increase in wealth results in a 0.33% increase in output (output–employment elasticity), while a 1% increase in training leads to a 0.16% increase in output. This reflects the cost advantages of organisational training versus upgrading capital stock or increasing employment numbers.

Mediating the demand and supply of labour is essential to develop the human resource needs of the country. Training issues related to the broad socio-economic issues of unemployment are being addressed by colleges for further education and training (FET)

that support intermediate skills training, while universities of technology attend to technician training (Daniels 2007, p. 23). Supply-side institutions, which include the Sector Education and Training Authorities (SETAs), private-sector training centres, and colleges need to provide entry-level proficiencies and other developmental processes to sustain low-skill, labour-intensive employment-generating approaches (Anon. 2008).

Universities, as part of the skills development structures in a country, play an imperative role in producing scarce skills and improving the effectiveness of the skills development system. As institutions of HE, universities provide tertiary education to students who have successfully completed secondary-level schooling (SANQF Level 4). A university is a social organisation consisting of people ranging from students and academic staff to support staff, management, and external stakeholders, and its principal activity is generating and sharing knowledge in a selection of disciplines. Hussein (2003, p. 48) stated that the way of life of a university encompasses the following three separate functions:

- formation of novel knowledge or research (an increase in problem-solving and strategic research, rather than disciplinary research);
- the transfer of knowledge through teaching; and
- professional and public service.

Within the knowledge economy, universities are strategic agents in local, regional, and national efforts to create and disseminate innovations, and to provide economically relevant human capital to the marketplace. They are noteworthy contributors to the production of innovations that steer the knowledge economy to economic competitiveness and social well-being. Innovation, a decisive element of the entrepreneurial economy, is created and moved into the marketplace by a highly educated workforce (Libecap 2009). Studies related to Universities' entrepreneurship and their impact is given in Table 30.

Table 30: Universities' entrepreneurship.

Researcher	Study	Impact
Kirp 2003	Universities have been restructured to accommodate the commercialization of research, pedagogies and instructional models	3 rd Stream of income / Knowledge sharing
Washburn, 2005	Faculty entrepreneurship neglects obligations to instruction and student learning	Student throughput
Burton R Clark 1998	Extols and outlines value of entrepreneurial approaches	Influence knowledge management in universities
Geiger 2004	Organisational and structural changes – for the purpose of better contributing to economic development and prosperity	Positions & explains entrepreneurship - building knowledge base / Impact of policies and organisational characteristics on academic knowledge
Etzkowitz 2003	Describes MIT evolution into one of world's most entrepreneurial institution	Case Study

Source: (Compiled from Libecap 2009, pp. 3-5).

'Higher Education is the major driver of the information/knowledge system linking it with economic development. However, higher education is much more than a simple instrument of economic development. Education is important for good citizenship and an enriching and diversifying life' (National Planning Commission 2012). Several studies have been undertaken by universities, with the goal of increasing the knowledge base and the comprehension of the entrepreneurial economy. Faculty members, on the other hand, connect with industry by means of commercial pursuits that play a part in economic growth and prosperity (Libecap 2009).

Chapter 6 discusses the integrated education and training framework applicable in SA as well as HE with specific reference to UP.

1.5 UNIVERSITIES' RESPONSIBILITY FOR HUMAN RESOURCE DEVELOPMENT

Globalisation has intensified the requirement for 'quality higher education in all developing countries' (Hussein 2003, p. 49), and has raised the prominence of higher education in a world that prioritises knowledge and innovation. HE is not only required to supply the needed quantity and quality of graduates, but also plays an important part in national innovation and development. The Southern African Regional Universities

Association (SARAU) did a study titled *Traditional Higher Education in Southern Africa* (Anon. 2008), which states that any investment in HE can be likened to an investment in national development. HE is thus accepted as the arena where skilled individuals cultivate competitiveness.

The examples of research given in Table 31 highlight the human capital and organisational development associated with HE, and the benefits that can be derived from a robust association between the academic and business sectors. Universities can make the greatest contribution to developing organisations' absorptive capacity by developing their graduates, besides providing knowledge to the organisations (Daghfous 2004, p. 25). This highlights the significance of university-generated scientific knowledge. According to Cohen and Levinthal (1989), organisational researchers need to consciously acknowledge and assimilate this external knowledge, and then exploit it.

Table 31: Human capital movement and explicit organisational development.

Researcher	Study
Zucker, Darby & Armstrong, 1998	<p>Shown that organisations that have a direct relationship with star scientists outperform organisations without such ties on several measures of innovative activity.</p> <p>Zucker et al. indicated that organisations directly linked to the intellectual capital of universities had</p> <ol style="list-style-type: none"> 1. 4x greater average increase in employment between 1989 and 1994 2. 9x as many products in development 3. >2 times as many products in the market in 1991
Zellner, 2003 Agrawal & Henderson, 2002	Hypothesised that hiring university graduates enhances organisations productivity and generates greater economic development
Audretsch, Lehmann & Warning, 2004	Found that young, knowledge-intensive organisations tend to locate closer to universities having larger student populations in both natural and social sciences. Location dimension is driven by value of students as conduits for knowledge transfer that has economic benefit
Cohen, Nelson & Walsch, 2002	Found hiring of recent graduates was considered to have been either moderately or very important in the completion of a major R&D project by 20% of respondents
Liebeskind, Amalya, Zucker & Brewer, 1996 Stephan, Sumell, Black & Adams, 2004 OwenSmith & Powell, 2004	Hiring graduate students contribute to obtaining an advantageous position in an industry inter-organisational network
Powell, Kaput. Smith-Doerr & Owen-Smith, 1999	Hiring graduate students enhances organisation performance
Crespi, Geuna & Nesta, 2007	Found that close to 10% of European academic inventors joined an organisation following patent application. Also academic inventors that were involved in more valuable and cumulative patents, showed greater propensity to move

Bania, Eberts & Fogerty, 1993	Found a positive relationship between university research expenditure and start-up rates in electrical and electronic equipment industries
Lockett & Wright, 2005 O'Shea, Allen, Chevalier & Roche, 2005 Powers & McDougall, 2005	Levels of research have been proved to be a positive and significant predictor of entrepreneurial undertakings
Di Gregorio & Shane, 2003 Powers & McDougall, 2005	Faculty academic productivity is associated with higher levels of spin-off activity
Owen-Smith, 2005	Prestigious universities that were early movers in technology transfer experience the greatest success when it comes to such activities
Shane, 2004	Start-ups in general and university spin-offs produce significant economic value via 1.2 Production and sales of innovative products 1.2 Generation of jobs 1.2 Inducements of follow-on investments
Special report Boston Bank 2003	Found MIT faculty and graduates founded 4000 organisations which in 1994 employed 1.1 million people and generated \$232 billion in sales
Shane, 2004 Blair & Hitchens, 1998 Charles & Conway, 2001	Number of jobs created per university-based start-up is significantly greater than the average for other non-university-related start-ups companies
Blair & Hitchens, 1998 Dahlstrand, 1997	University-based start-ups outperform their peers
Savage, 2006	Failure rates of university-based start-ups are on average lower than failure rates of typical start-ups
Rotheamel & Thursby, 2005	Start-ups that licensed their technology from the Georgia Institute of Technology were 2.2 times less likely to fail than ventures not licensed from Georgia Institute of Technology

Source: (Libecap 2009, pp. 10-12).

Marginson (2006) highlighted the integral role of HE in the incessant flow of people, knowledge, information, technologies, products, and financial capital in the context of globalisation. In a knowledge society, universities are important conduits in global knowledge economies. According to the Minister of Higher Education and Training, students need to be 'grounded in the developmental challenges that face our country,' and should be 'adequately equipped to ... [produce] ideas that are more appropriate to our own challenges, and those facing the South in general.' Universities need to find ways to identify and address national development and economic needs through quality learning programmes that produce relevant priority skills, so that the country can benefit from graduates with the appropriate attributes (Nzimande 2011).

HE has moved into a period of upheaval within volatile, complex, and increasingly demanding environments. According to the Trends in Global Higher Education report (2008–2009) and Clarke (1998, in Middlehurst 2005, p. 268), the characteristics of the global age include issues such as:

- massification of higher education — expanding social inclusion (access) and participation leading to an increase in student numbers;
- diversity of student cohorts in terms of race and language;
- a mounting need of knowledge-based enterprises for competent and highly specialised graduates to contribute directly to social and economic challenges;
- the impact of outcomes-based education on the education system;
- the trend to professionalise higher-education teaching;
- the exponential internationalisation of research and technology;
- and the academic mobility (internationalisation) of highly trained professionals.

This has challenged universities to balance local needs and priorities with internationally referenced standards, in order to be internationally competitive.

Universities do not only react, but also take a pro-active role in facing challenges and opportunities. These institutions are becoming ‘platforms of co-created innovations and improvements in society’ (Laine *et al.* 2008, p. 7). The fundamental pillars of the mission of universities used to be research and teaching (Leisyte & Horta 2011, pp. 422-423), but a new task has been added — that of knowledge transfer (community outreach) for the welfare and affluence of citizens. Civic engagement, expressed as an enhanced sense of responsibility to one’s community, encompasses global citizenship and interdependence and is embedded in the curriculum (Jacoby 2009). In the knowledge society, HE is thus facing new challenges and opportunities:

- growing competition for students between universities;
- adhering to a multi-disciplinary methodology;
- boosting external funding;
- participating in innovation networks at regional, national, and international levels;
- research in applications combined with market intelligence; and
- acting as incubators for disruptive innovation and entrepreneurship.

Universities need to participate in two types of innovation processes (Cosh *et al.* 2004): those that are goal-oriented, with known targets; and open-ended processes searching for novel strategies, markets, challenges, and goals. They also need to help others to innovate. This influences the organisation of teaching and research (based on

partnerships and dynamic networking). Universities need to extend their innovative interaction and to influence other innovation ecosystems, leading to: innovations and innovating research; modelling innovation processes; participating in networks of innovation; changed responsibility in the innovation ecosystem; and an improved innovative climate in institutions of HE. The outside world is being brought into academia, and universities need to combine research and education in their knowledge transfer activities (Laine *et al.* 2008, pp. 11-12). Lecturers and students are indispensable participants in the co-creation of innovations.

Traditionally, universities have represented the principal source of novel knowledge, while also possessing students and scientists in reserve. Additionally, some authors have proved that organisations possess a certain potential for growth and innovation, if they originate from an academic environment (Steffensen *et al.* 2000), as studies have proven that individuals who have obtained a university degree display higher entrepreneurial tendencies (Bergmann & Sternberg 2007). Circumstances have changed during the last decades, and tertiary institutions need to strengthen their functions accordingly (Gibb 1996; Etzkowitz *et al.* 2000). Thus, besides teaching-oriented functions, tertiary institutions are expected to transfer a wide-range of skills, which include establishing an entrepreneurial mindset.

Science policies have become multifaceted, often combined with higher education and economic policies, to allow for broader systemic impacts and synergies (Clarke 2010). These policies highlight the role of the third mission of the university. The arrival of the global economy also demands more than mere relevance in the provision of education, but also a growing public accountability regarding innovation. Powerful opportunities are offered to the HE sector through inducing innovation to generate fundamental economic value on an array of outcome platforms (McBurnie 2001, p. 11). The focus of education needs to address skills development to produce economic innovation; gain a competitive advantage; and is steered by government through its funding formulas for universities.

Focusing on knowledge for innovation, developed and enhanced through human capital development, as an important factor that contributes to innovation as an economic driver, brings the role of universities to the fore. Universities are vital for the socio-economic

development of a country, and can therefore not exist in isolation. They are constantly challenged by developmental concerns, social commitment, and alliances, and this leads to a robust HE sector, as it increases competition amongst such institutions (St. George 2006, p. 589). The World Bank has echoed this responsibility: 'The norms, values, attitude, ethics and knowledge that tertiary institutions can impart to students constitute the social capital necessary to construct healthy civil societies and socially cohesive cultures' (World Bank 2000).

Within universities, specialisation of knowledge or disciplines are configured into departments, headed by a head of department (HOD). Departments are grouped into faculties, each managed by a dean. A board of trustees, a chancellor, and sometimes vice-chancellors govern and steer these universities through policies. The differences between groups — faculties, departments, and academic programmes — are remarkable, and each acts according to its own doctrine of local interaction. Engendering change is a difficult task, because the diverse patterns of behaviour that are displayed in a complex organisational system such as a university are not determined by individuals or groups (Mc Roy *et al.* 2009, pp. 687-688). The power of the most influential parties dominate the change process towards those who control the funds and government subsidies, and away from academics who generate the knowledge (Mc-Roy *et al.* 2009, p. 700).

Higgs (2004, p. 28) concurred with the above concepts, and added that a university should have:

- autonomy of purpose — perceived as a pragmatic protection, because universities cannot be creatures of rigid political control exercised for supposedly political, social, and economic ends;
- academic freedom — committed to the answerable exercising of freedom of expression and inquiry; in this regard, a university in its pursuit of truth will place genuine academic thought in permanent opposition to received dogmas, and will seek to teach people how to think, and not dictate to them what they should think;

- universal values — concerned with the common good, involving a disconnection from conflicting interests and a capability of imagining a solution bigger than a compromise between conflicting interests; and
- high standards — by achieving excellence in the quest of truth. This is dependent on the quality of entering and graduating students, the calibre of the academic community, the scholarly philosophy of the university, the research and scholarly productivity of the institution, and its national and international standing. Four fundamental aspects of quality, namely entry criteria, attainment levels at graduation, quality of staff, and demonstrable attainment in published scholarship are central to a commitment to high standards. Low standards guarantee mediocrity and the demise of critical and creative endeavours.

A successful triad relationship between industry, academia, and government is paramount in delivering the necessary innovation that will translate into value for society at large (Makgoba 2010, p. 68). Tertiary institutions act as hubs of expertise and knowledge capital, promoting critical thinking, and could confer considerable economic benefit on graduates, preparing them to become responsible citizens.

1.6 EMPLOYER EXPECTATIONS OF HE

Learning, a core process in the academic offerings to students in HE, encapsulates a process of abstract transformation whereby learners create new comprehensions of reality; this process must be in accord with cultivating the much-needed innovative capabilities of the future generation (Reushle & McDonald 2010). The current HE environment strives towards academic excellence, which is located within the wider social, economic, and political context, underpinned by ideologies of education (Skelton 2004, p. 452). One of the dimensions that indicates excellence is the improvement of teaching and the development and adoption of teaching innovation (Du Plessis 2005, p. 1382). To be successful such change initiatives need to act in response to the shortcomings of conventional educational cultures and conduct and not challenge the professional autonomy of academic staff. The crucial role of change agents is to identify

the primary clients and to deliver on their needs and expectations, as this will stimulate innovation adoption where it can be sustained (Chowdhury 2010, p. 50).

Government has focused on the communication between HE and employment, and, as such, graduate attributes are embedded within the Joint Initiative for Priority Skills Acquisition (JIPSA). The pressure is on HE to deliver graduates with practical skills, understanding, personal attributes, and metacognition, and who are employable because they have the right attributes to contribute to the job-creation potential of the country.

There is a complex and conditional relationship between HE and economic growth (Wolf 2002, in Kruss 2006). HE and industry share a common misunderstanding about the role they play in human capital development towards economic growth and societal progress. Given the pressing skills requirements of the South African economy, the role of HE can be expressed in the words of the former South African Deputy President Mlambo-Ngcuka (2006):

The phenomenon of unemployed graduates, who are without abilities to self-employ and self-determine, after spending three to four years of post-secondary education is an indication to all of us of the challenge in our education at tertiary level ... the curriculum developers are not paying enough attention to issues of relevance and ensuring that we all pay attention to the skills and competencies learners require when they come out of higher education ... we need a skills revolution in the curriculum of tertiary education. (Mlambo-Ngcuka 2006, in Griesel & Parker 2009, p. 2).

1.1.1 Graduate attributes

The essence of gradueness implies a transformation in students by contributing to their personal growth and their intellectual development. The domains of gradueness are given as: reflective thinking, scholarship, citizenship and lifelong learning (Steur, Jansen & Hofman 2012). Gradueness or employability is influenced by four inter-related components: skilful practices, deep understandings grounded in a disciplinary base, metacognition, and beliefs about personal identity and self-worth (Yorke & Knight 2006).

HE reviewed the economic value of education, while the neoliberalisation of HE created an imperative for government to take control of and lead the employability discourse

(Brown 2003). The state specifies frameworks for teaching in HE, to deliver graduates equipped with job-specific attributes. Brown (2003) further argued that the current discourse on employability places maximum importance on the economic value of education. Through lifelong learning, employees acquire traits and abilities that promote economic productivity and growth. By coining the concept of employability and seeking to oust the role of labour markets, the state has:

- created an expectation that graduates ought to be ready for the job, rather than prepared for employment;
- lessened the agency of most universities over the employment skills they develop, their curricula, and the type of education and graduates they produce;
- identified the student as a customer, and education as an investment that yields long-term benefits (Brown 2003).

Srathdee (2005) argued that the employability of university graduates will be used to build universities' reputations. Boden *et al.* (2000) argued that it is difficult to label the content of employability, as it describes the intersection of the needs of diverse employers and individuals' attributes, but it is a 'gathering of attributes that make individual graduates inherently employable and successful' (Boden & Nedeva 2010, pp. 37-54).

HE needs to produce thinking, responsive, and intellectually well-grounded individuals. They need to be adaptable and able to confront fresh requests and challenges. From a investigation by Higher Education South Africa (HESA) on South African graduates, the primary components of employer expectations are summarised in Table 32.

Table 32: Summary of principal components of employer expectations.

Principal components	Revised constructs	Satisfaction rating "what you get"	Importance rating "what you expect"	Gap
Basic skills and understanding				
<ul style="list-style-type: none"> Proficiency in English Written communication skills Oral presentation skills 	Communicative competence in English, including the "tools", concepts and strategies through which to demonstrate skills and understanding	4.4	3.3	1.1
Prior exposure to work Knowing the organisation	Understanding the world of work	3.7	3.0	0.7
<ul style="list-style-type: none"> Technical ability Computer literacy Ability to find & access information 		4.5	3.4	1.1
Knowledge and intellectual ability				
<ul style="list-style-type: none"> Rapid conceptualisation of issues Ability to follow and construct logical argument 	Intellectual ability grounded in both discipline and general knowledge and an appropriate approach to knowledge production and cognitive "openness" to continued learning.	4.3	3.2	1.1
<ul style="list-style-type: none"> Understanding of core principles General knowledge about local and global affairs Subject or discipline knowledge 		4.2	3.2	1.0
<ul style="list-style-type: none"> Interest in ideas and desire to continue learning 		4.6	3.8	0.79
Workplace skills and applied knowledge				
<ul style="list-style-type: none"> Understanding of changing workplace practices 		4.4	3.1	1.27
<ul style="list-style-type: none"> Ability to recognise a problem situation Ability to choose appropriate information to address problems An appropriate approach to problem solving 		4.5	3.2	1.3
Personal and interactive skills				
<ul style="list-style-type: none"> Sense of identity and self-confidence Negotiation and mediation skills 		4.3	3.2	1.1
<ul style="list-style-type: none"> Contribution to teambuilding and work Ability to relate to a wide range of people Appreciation of different cultural contexts 		4.5	3.5	1
<ul style="list-style-type: none"> Openness and flexibility 		4.9	3.4	1.7

Source: (HESA 2009, pp.17-18).

The key to employability is that educators aspire to graduate students with the right graduate attributes encompassing a solid foundation in the knowledge and skills they will need to be productive managers and effective leaders. Other desirable graduate attributes, identified from the literature, are included in Table 33.

Table 33: Graduate attributes, linked to the value they add.

Graduate attribute	Why
Emotional intelligence (Tucker <i>et al.</i> , (2000: 336))	By implementing emotional intelligence theory and exercises, faculty will help students become well-rounded graduates (Pool <i>et al.</i> ,2007:283). A major goal of formal education should be to equip students with the intellectual tools, efficacy beliefs, and intrinsic interests to educate themselves throughout their lifetime. (Pool <i>et al.</i> ,2007:286).
Moral literacy (Lee-Boggs (2007))	Educators need to engage students in meaningful and critical discourse around social, cultural, economic, and political issues to promote moral literacy (Normore & Doscher, 2007:429). Moral literacy ensures that students become knowledgeable moral agents, holding moral virtues, and developing skills for moral reasoning. Students need to be taught the importance of assuming responsibility to be informed and assert them-selves to take social imperatives into account, before making moral judgments (Tuana, 2003:8) (Normore & Doscher, 2007:428-429)
Interpersonal skills, the capacity to manage uncertainty and ambiguity, and certain types of inductive problem solving ability (ARC Centre of Excellence for Creative Industries and Innovation, 2007:11)	It is now widely accepted that advanced nations are shifting to information-based, knowledge-driven “creative economies”, where creativity is a key determinant of economic growth (Department for Culture Media and Sport, 2008, Department of Communications Industry Technology and the Arts, 2008) and make creative graduates valuable throughout the innovation economy. The creative industries not only contribute directly to the economy through the gross domestic product (GDP), but are also significant drivers of economic growth across other industries (Potts, 2007) by originating and synthesising innovation in the underlying knowledge base of the economy (Hearn & Rooney, 2008; National Endowment for Science Technology and the Arts, 2006:10)

Source: (Own compilation from literature).

1.1.2 Employability

At graduate employment level and further, high-level discipline-explicit skills and knowledge, as well as skills in determining employability, are crucial. In HE provision, professional-level discipline-specific content remains the core component. Traditionally, universities enjoyed a meaningful degree of discretion regarding the required employment skills, and these skills were always regarded as a feature of universities’ relationship with the labour market. Employability has changed, and is now a performative function of universities, shaped and directed by the state in seeking to supplant labour markets (Boden & Nedeva 2010). This implies that HE needs to attend to the questions around skills mismatches and disparities employers have identified in new employees (HE Funding Council for England 2003). Swift changes in workforce requirements have led to erroneous projection of needed skills (Bridgstock 2011, p. 12). Hillage and Pollard (1998, p. 2) proposed that employability is the capability of people to be independently mobile to utilise their capabilities, to reach full potential in order to sustain employment. They propose the following elements of employability:

Table 34: Elements of employability.

Elements	Consists of
1. employability assets	knowledge, skills and attitudes
2. deployment	career management skills , including job search skills
3. presentation	Job-getting skills (CV writing, work experience and interview techniques)
4. personal circumstances external factors	e.g. family responsibilities e.g. current level of opportunity within the labour market
<p>Bennett et al. (1999:278) proposed a model of course provision in higher education which includes five elements:</p> <ol style="list-style-type: none"> 1. disciplinary content knowledge; 2. disciplinary skills; 3. workplace awareness; 4. workplace experience; 5. generic skills. <p>This model includes four inter-related components of employability:</p> <ol style="list-style-type: none"> 1. understanding; 2. skills; 3. efficacy beliefs; 4. meta-cognition. 	

Source: (Hillage & Pollard 1998 p.2).

The better qualified an individual is, the greater the employment opportunities that tender themselves. Admittance to university is mostly seen as a way to gain a degree by gaining an in-depth knowledge of a specific discipline, thereby gaining a higher qualification, leading to a good job (Johnes 2006, p. 281). Employers use the only measure available to them to judge graduates, and that is the way in which they completed their qualification. Despite the fact that knowledge and understanding, together with skills, in the specific subject are essential, it is improbable that these alone will secure a graduate an occupation. Generic skills that support learning in any discipline and that can be transferred to a breadth of contexts in HE or the place of work (Bennett *et al.*, in Pool 2007, p. 282) is just as important. Several transferable skills that employers are looking for are given in Table 35.

Table 35: Generic skills that employers expect from graduates.

Generic skills	
1. imagination/creativity	2. communication in writing for varied purposes/audiences
3. adaptability/flexibility	4. numeracy
5. willingness to learn	6. attention to detail
7. independent working/autonomy	8. time management
9. working in a team	10. assumption of responsibility and for making decisions
11. ability to manage others	12. planning, coordinating and organising ability
13. ability to work under pressure	14. ability to use new approaches
15. good oral communication	16. enterprise and entrepreneurship skills

Source: (Pool 2007, p. 282).

According to the literature, a gap exists between entry-level graduate employment skill requirements and the skill levels of entry-level graduate job applicants (Central Bank of Sri Lanka 2003; Davies 2000; Ranasinghe & Herath 2011). National, economic, and social wellbeing is dependent on a healthy supply of skilled, employable graduates, and failure to obtain this has wide-ranging consequences (Bhaerman & Spill 1988; Central Bank of Sri Lanka 2003). Training in skills to enhance employability has become an ethical responsibility of HE (Bhaerman & Spill 1988) (Wickramasinghe *et al.* 2010, pp. 226-227).

Table 36: Employability skills.

Employability skills					
Definition	<p>A set of achievements that comprise skills, understanding and personal attributes that make an individual more likely to secure and be successful in his/her chosen occupation to the benefit of him/herself, the workforce, the community and the economy (Yorke & Knight, 2004).</p> <p>Buck and Barrick (1987:229) state that employability skills are attributes of employees, other than technical competence, that make them an asset to an employer. Employability is defined as having the skills and abilities to find employment, remain in employment or obtain new employment as, and when, required (Hillage & Pollard, 1998; Rothwell & Arnold, 2007; Thijssen et al., 2008). More specifically, employability can be seen as a “psycho-social construct” embodying a range of individual characteristics that facilitate adaptive behaviours necessary to maintain on-going employment within rapidly changing employment environments (Fugate et al., 2004:16).</p> <p>Alternatively, it can be seen as a function of the labour market context with labour supply and demand determining an individual’s employability at any given time (Forrier & Sels, 2003).</p>				
Aspects of employability	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">subject skills</td> <td style="padding: 5px;">Subject skills are more relevant to ones’ career (Cox and King, 2006).</td> </tr> <tr> <td style="padding: 5px;">transferable skills</td> <td style="padding: 5px;">Certain personal abilities of an individual, that can be taken from one job role to another, used within any profession and at any stage of one’s career, while subject skills are more relevant to ones’ career (Cox and King, 2006).</td> </tr> </table>	subject skills	Subject skills are more relevant to ones’ career (Cox and King, 2006).	transferable skills	Certain personal abilities of an individual, that can be taken from one job role to another, used within any profession and at any stage of one’s career, while subject skills are more relevant to ones’ career (Cox and King, 2006).
subject skills	Subject skills are more relevant to ones’ career (Cox and King, 2006).				
transferable skills	Certain personal abilities of an individual, that can be taken from one job role to another, used within any profession and at any stage of one’s career, while subject skills are more relevant to ones’ career (Cox and King, 2006).				
Demand for graduates	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%; padding: 5px;">technical skills (“technical specific”)</td> <td style="padding: 5px;">For instance a software design company needs employees with specific computer software skills, consequently only graduates from associated degree programmes could do the job. The technically specific jobs could only be done by those with the necessary technical skills.</td> </tr> <tr> <td style="padding: 5px;">“generic graduate” skills</td> <td style="padding: 5px;">For example, as a company grows it starts needing administrators and managers, posts that tend to be increasingly filled by graduates. These jobs draw more upon generic graduate skills than technically specific ones. A graduate from a wide range of degree programmes could do these jobs whereas the technically specific jobs could only be done by those with the necessary technical skills.</td> </tr> </table>	technical skills (“technical specific”)	For instance a software design company needs employees with specific computer software skills, consequently only graduates from associated degree programmes could do the job. The technically specific jobs could only be done by those with the necessary technical skills.	“generic graduate” skills	For example, as a company grows it starts needing administrators and managers, posts that tend to be increasingly filled by graduates. These jobs draw more upon generic graduate skills than technically specific ones. A graduate from a wide range of degree programmes could do these jobs whereas the technically specific jobs could only be done by those with the necessary technical skills.
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Source: (Wickramasinghe *et al.* 2010, p. 229; Woods *et al.* 2009, p. 648).

Changes in employment patterns and organisations downsizing the workforce have forced employees to attend to a broader assortment of tasks than previously, and to be more adaptable in addressing the needs of customers (Fallows & Steven 2000). As a result of the fast-changing employment environment, permanence and traditional career paths are not necessarily the norm any longer (Clarke 2008; Fallows & Steven 2000). Graduate attributes are more important than specific occupational skills (LIRNEasia 2006; Young 1986). Employers are interested in graduates’ ability to manage complex information and successfully communicate it, rather than the subjects studied during the

degree programme (Knight & Yorke 2002; LIRNEasia 2006; Wickramasinghe *et al.* 2010, pp. 229-230).

Swiatek (2000) found that the significance given to employability skills by graduates and employers differ. Employability skills should be included in the academic curricula across all disciplines, as opposed to creating a separate *employability course* (Fallows & Steven 2000; Wickramasinghe *et al.* 2010, p. 230). The most important employability skills are: problem solving, self-confidence, and team work (Wickramasinghe *et al.* 2010, pp. 238-239). A driver for universities to focus more on employability is that a key measure of university performance is graduates' employment after graduation (Woods *et al.* 2009, p. 645).

Shah *et al.* (2004) carried out a longitudinal survey. They found that, four years after graduating, one-third of graduates were still working in jobs that were not graduate level and were unrelated to their degree topic. Graduates need to seek smaller organisations and be willing to work in jobs that do not need their specific degree qualifications. HE will have to prepare graduates for working in organisations that demand markedly different skill sets from those required in larger organisations. The converse is also true. Graduates will have to be prepared to take jobs that a generation ago were done by non-graduates. This analysis leads to the fragmentation of the labour market as is portrayed in Table 37.

Table 37: The fragmentation of the graduate labour market by organisation.

Fragmentation of the graduate labour market
1. Employment in an organisation that requires "graduateness" of the student but is unconcerned about the subject studied. Any degree is suitable. (+/- 30%)
2. Employment in an organisation that requires the student's degree area but does not need "graduateness". Only degrees in specified areas are considered.
3. Employment in an organisation that requires both "graduateness" and a specific degree(s).
4. Employment in an organisation that does not need either the degree area or "graduateness". (+/- 40%)

Source: (Woods *et al.* 2009, p. 645).

Considering the four variations in Table 37, graduateness is more important than subject choice, if universities are perceived to be providing graduates to the labour market (Woods *et al.* 2009, p. 645). Shah *et al.* (2004), in their longitudinal study of graduate destinations, found that half of graduates needed to undertake further study in addition to subject knowledge. These studies included transferable skills comprising: oral and written communication, team-work, personal organisation, and self-motivation (Woods *et al.* 2009, p. 646). The outcomes of this study illustrated the function of universities in preparing students for life and lifelong learning (Raybould *et al.* 2005, p. 205), but also proposed that the prominence academics place on development of conceptual and analytical skills is, to some degree, not appreciated by possible employers of graduates.

Higher education needs to focus on producing graduates to fill existing jobs, and on delivering graduates who can create novel positions in a dynamic growth sector of the economy (Crossman & Clarke 2010, pp. 599-613). Graduate employability is a vital yardstick for evaluating performance, individually as well as institutionally (Harvey 2001). Employability ensures that graduates are competent to contribute to 'economic competitiveness in a global context' (Cranmer 2006, p. 170). To accomplish this goal, degrees have to be focused on the attainment of critical subject-specific knowledge and skills, as well as transferable knowledge, skills, and attitudes (Leckey & McGuigan 1997; Cox & King 2006), listed in Table 38.

Table 38: Transferable knowledge, skills, and attitudes.

Transferable knowledge, skills and attitudes
Oral communication
High-level learning skills
Problem solving
Decision making
Affective skills and traits such as: <ul style="list-style-type: none"> • responsibility • a positive attitude • interpersonal skills • the ability to work both in a team and independently

Source: (Cassidy 2006, p. 509).

Focusing on graduate employability rather than knowledge acquisition, HE has admitted the 'need for graduates to develop a range of personal and intellectual skills beyond specific expertise in an academic discipline' (Shah *et al.* 2004, p. 9). Barrie (2006, p.

224) investigated the perceptions from academics of what graduate attributes are and these results are reflected in Table 39.

Table 39: Graduates' generic attributes.

Referential (what is meant)				
Structural (internal & external horizon)			Additive:	Transformative:
			GGA are discrete from other university learning outcomes	GGA interact with other university learning outcomes
	Irrelevant:	No aspect of GGA in the foreground, they are ignored. The relationship to other learning outcomes is as a backdrop	1. Necessary basic PRECURSOR skills, but irrelevant as they are a prerequisite for university entry	
	Unrelated:	In the foreground are undifferentiated functional atomistic personal skills that are related to discipline knowledge	2. Useful skills that COMPLEMENT or round out disciplinary learning	
	Application:	In the foreground are clusters of specialised abilities and skills of application relevant to discipline knowledge		3. These are the abilities that let students TRANSLATE make use of or apply disciplinary knowledge in the world
Integral substrate:	In the foreground are interwoven abilities and aptitudes for learning. These aptitudes shape disciplinary and other knowledge		4. They are the abilities that infuse and ENABLE university learning and knowledge	

Source: (Barrie 2006, p. 224).

1.7 HE AS ENERGY TO BUILD KNOWLEDGE-BASED ECONOMIES

An important element of the learning economy is the development of human capital. According to Williams and McGuire (2010, p. 395), global problems demand multidisciplinary solutions that emphasise the importance of knowledge and creativity to an economy. In order to survive today's rapid multifaceted changes, countries need internal capacity to seek creative and alternative perspectives (McManus 2010, p. 18). In the modern knowledge economy, knowledge, the principal currency, is created primarily by universities and other HE institutions. According to Robertson (2008, p. 221), HE can act as the dynamism for building a learning economy, and has been progressively formed by strategic, political, and economic interests. Knowledge, an indispensable instrument in the quest for personal and professional success of individuals, can be acquired in the

classroom (Palacio *et al.* 2002). To effectively amass knowledge, promote social and economic development, and augment economic competitiveness, universities need to enhance their knowledge transfer mechanisms.

New challenges in education offer prodigious opportunities to innovate and transform SA's twentieth century educational model. The realisation of an innovation strategy is attained by developing transformational leaders that can cultivate a talent-driven and improvement-driven culture to translate potential into energy and unleash passion and performance. Such leaders need to contribute to the successful conception, understanding, and implementation of novel ideas that create value for the organisation, and are critical to the growth and survival of any organisation.

Traditional training is rooted in being logical and rational, while creativity manifests in reflexivity or the capacity to renew and re-invent one's own view of the world. The practice of specialists in one field borrowing an idea or technique from another specialised field and applying it to their own field has pushed forward the frontiers of knowledge. This diversity in interests and the right to explore new and, possibly, unpopular ideas lie at the base of problems in academic freedom (Torrance 1995). The individual's domain of knowledge or expertise as defined by Adams (2005, p. 4) constitutes the balance connecting the magnitude and complexity of his or her knowledge, to maximise creative potential. The intellectual expertise is enriched by technical and procedural expertise, coupled with the environment that influences creative thinking skills, and is an indication of how flexibly and imaginatively people approach problems.

Universities have an effect on regional innovation processes. The HE sector needs to identify pathways by which to address national human resource development and economic needs, including delivering innovation potential in graduates, to improve effectiveness in the country. The value accrued in the knowledge economy will be due to the ability of knowledge workers, particularly graduates from university, to apply new knowledge in the workplace.

An improved knowledge foundation and, in particular, scientific knowledge deliver more effective inventions, once the invention search process is complex (Fleming & Sorenson 2004). An improved knowledge foundation also contributes to innovative outcomes, and gives an understanding of the fundamental principles underpinning a system. Knowledge developed through prior experimentation (*what* happened) and scientific knowledge (knowledge of *why*) are different (Fleming & Sorenson 2004). Scientific knowledge has an appreciation of the area being searched, and allows feedback from experimentation in the overall context of scientific knowledge, providing additional opportunities for extrapolation and learning (Fabrizio 2009).

A university is a social innovation with its own domain, and is important for economic and social development (Fuglsang 2008, pp. 8-9). Scientific knowledge is created via university knowledge-generation activities. For innovation to be adopted within knowledge-generation activities, the right organisational conditions are needed, including appropriate leadership style, culture, structures, systems, and resources (Andriopoulos & Dawson 2009, p. 8). People do not adopt innovation outside of a situated problem. It is therefore important to create the right micro-environment, where people possess some domain-relevant skills and intrinsic motivation to contextualise creative ideas and appropriate meaning.

Universities' drive to promote entrepreneurship (third-stream income), which intersects with academic capitalism, has transformed HE structures, and replaced traditional instructional and scholarly activities with market- and market-like behaviour. This has happened at a cost to instructional activities and student learning (Kirp 2003), and created tension between the commercial and social sides of innovation. In this context, the mechanism of selection and diffusion is a complex interaction between market mechanisms and social mechanisms (Fuglsang 2008, pp. 7-12).

According to Skelton (2004, p. 452), quality teaching in HE is a "contested concept," and has numerous divergent meanings linked to it. To ensure and promote this concept within the university context, a common understanding needs to be reached regarding both knowledge and presentation (Devlin & Samarawickrema 2010, p. 111). Both

student learning and lecturer teaching need to be taken into account, encapsulating future needs, and accounting for the complexity and impact of the context (societal, political, economic, technological, and demographic) on the teaching quality.

Rae *et al.* (2010, p. 5) argues that, from 2010, the shifting nuances of the employment market have meant that public-sector organisations demand fewer graduates. Knowing that enterprising graduates are generally more employable, graduates will need to develop options for starting their own businesses, working in small firms, generally in the private sector, as well as in social enterprises and third-sector organisations (organisations that are neither public sector nor private sector). Entrepreneurship should be seen as a graduate employment outcome, which, at present, is not the case (Rae *et al.* 2010, p. 5). The alternative to enabling graduates to be entrepreneurs in launching and developing their careers may be underemployment and unemployment, with costly economic and social consequences.

1.8 PROBLEM STATEMENT

Almost every single major challenge confronting SA is the result of human and social dynamics. The challenge for SA is to intensify the country's ability to better understand the dynamic forces of human and social conduct at all levels, to expect the complex consequences associated with change, to have a better grasp of the social structures responsible for creating and defining change, and to assist individuals and organisations to better supervise significant and prompt change. The government has a broad developmental mandate for improved competitiveness and economic growth, which can only be realised if SA becomes a knowledge-based economy, with science and technology, information, and learning at the centre of economic activity. The aim is a knowledge-based economy, resting on four interconnected, interdependent pillars:

- innovation,
- economic and institutional infrastructure,
- information infrastructure, and
- education.

A knowledge-based economy is driven by human capital development, knowledge generation and exploitation (R&D), and knowledge infrastructure and enablers to address the ‘innovation chasm’ between research results and socioeconomic outcomes. SA’s innovation revolution must help solve our society’s deep and pressing socioeconomic challenges and build national prosperity. This link between innovation and national prosperity is explained in Figure 6.

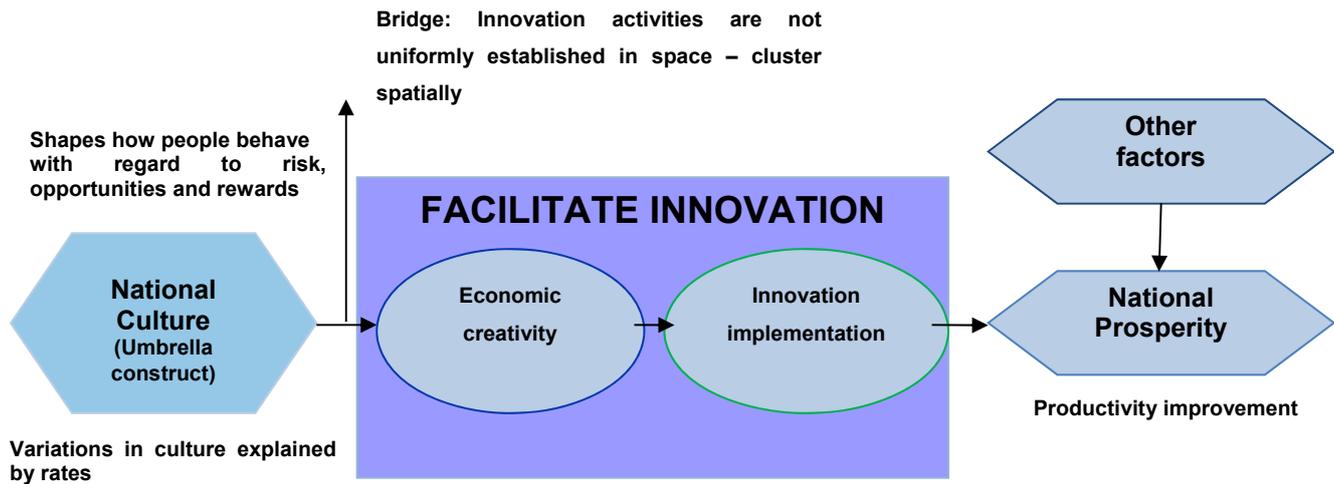


Figure 6: Linking innovation to national prosperity.

Source: (Adapted from Williams and Mc Guire 2010, p. 392).

SA is investing in human capital by engaging with development and innovative global businesses. This is an attempt to trim down the country’s reliance on imported technology.

Higher Education is the major driver of the information/knowledge system, linking it with economic development. However, higher education is much more than a simple instrument of economic development. Education is important for good citizenship and enriching and diversifying life... Massive investments in the higher education system have not produced better outcomes in the level of academic performance or graduation rates. While enrolment and attainment gaps have narrowed across different race groups, the quality of education for the vast majority has remained poor at all levels. The higher education therefore tends to be a low-participation, high attrition system. (National Planning Commission 2012)

The availability and utilisation of highly skilled labour that functions with a passable degree of social efficiency is the most salient discriminator between developed and

developing countries (Hanushek & Woessmann 2007, p. 16). Provided that *alumni* act as “*innovators*” and “*equilibrators*” in the knowledge economy (Lundvall 2008, p. 7), and that the quality of education, skills, innovation, and flexibility influences economic performance (Hanushek & Woessmann 2007, p. 16), universities should be leveraged to produce the range of skills needed for advanced economies, in order to induce economic growth.

The focal point of this thesis was to investigate and interpret innovation adoption by academics in a HE context, and identify critical enablers and barriers influencing the process of adoption. The identified enablers of such innovative change processes need to be managed so that innovation adoption is aligned with the expectations of stakeholders and the needs and values of students. The central theme of the study is the adoption or diffusion of innovation and the recognition thereof by the institution. The results may point to a need to augment the criteria for measuring the quality of the institution’s core functions, namely teaching and learning, research, and community engagement, by fostering innovative environments and producing appropriately skilled graduates. The study aimed to isolate and describe the combination of factors, in the academic environment and within the academics themselves, that ignites the will to adopt innovation in spite of inhibiting and conflicting demands. The innovation awards process of UP was chosen as the source from which the units of analysis, the academics, were selected. The nominations of individuals considered as innovators are peer reviewed within the only formal university process giving recognition to academics’ endeavours to adopt innovation. Nominees may either be nominated or nominate themselves. The research focuses on innovation at the level of individuals in the university, because individuals’ actions are of crucial importance for continuous innovation and improvement (De Jong & Den Hartog 2010, p. 23). This conception is found, not only in academic literature on innovation, but also stressed in works on related management principles, including total quality management (McLoughlin & Harris 1997) and corporate entrepreneurship (Sharma & Chrisman 1999).

This innovation awards process requires that ideas be implemented, which demands considerable effort and a result-oriented attitude (De Jong & Den Hartog 2010, pp. 24-25). Idea implementation also includes making innovations part of regular work processes

(Kleynsen & Street 2001) and behaviours, such as developing new products or work processes and testing and modifying these (Kanter 1988). Individuals considered to be innovators were selected to participate on the basis of their willingness to share information in an unconstrained environment.

1.9 PURPOSE STATEMENT

Research (Gartner Higher Education Trends 2009) has shown that, in HE, a contradiction in approach exists between the organisational processes and governance, on the one hand, and the academic freedom and research priorities of academics, on the other. Academic institutions like universities need to investigate their business approach, to establish the extent of the alignment connecting the national and organisational requirements with those of the individual, to ensure student engagement and student success throughout the student lifecycle.

The responsibilities of HE institutions are key in benefitting modern society; HE institutions need to enhance learners' humanity and global consciousness, and foster responsible citizenship by engaging them in life-long learning. Acquired skills need to be based on successful encounters and unassailable proof, focusing on the future. Learning processes need to be characterised by creativity and adaptability, in order to facilitate learning. Universities need to foster clear-thinking, astute, adaptable, and resourceful problem-solvers who will apply their developed capacity to improve the world. This transformation needs to be enriched through technology, which can influence and inform the academic work done by lecturers (Laurillard 2002).

This study aimed to analyse the process of change in context, to observe which factors influence innovation adoption by academics. Positive factors need to be nurtured, in order for HE to be adapted to meet the graduate demands of a global economy through a differently prepared student cohort. On the other hand, factors that hinder innovation adoption could be minimised.

1.10 RESEARCH OBJECTIVES

Diffusion is a negotiated social process in which ‘subjectively perceived information about a new idea is communicated from person to person. The meaning of an innovation is thus gradually worked out through a process of social construction’ (Rogers 2003, pp. xx-xxi). Social construction provides a richer understanding of the social context in which innovation occurs. A range of social, economic, political, and cultural elements influence the innovation process; it makes sense to chart the relationship between these elements through a process of flexible interpretation.

An educational system is a complex system shaped by a unique permutation of pedagogical, social, and technological components.

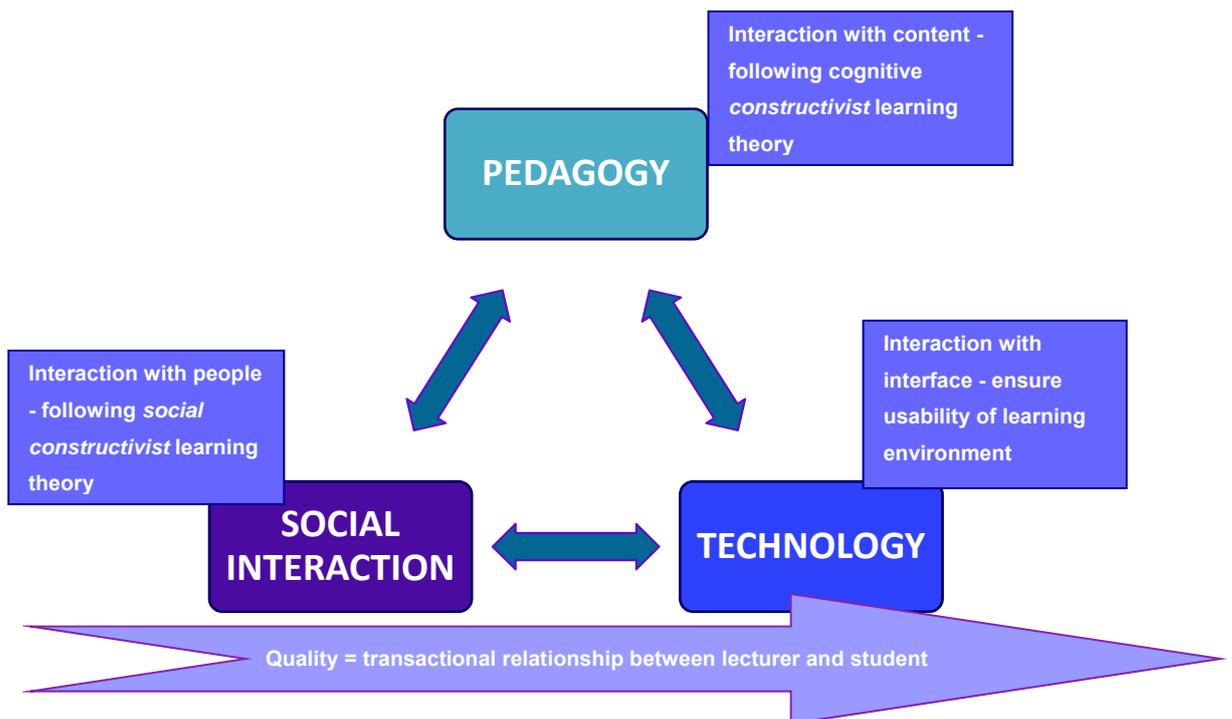


Figure 7: Educational system permutation.

Source: (Wang 2008:411).

According to Wang (2008, pp. 411-412), the pedagogical and social designs are the primary factors that influence the effectiveness of learning. Wang positions these factors as crucial for distinguishing a learning system from that of other communities. These factors predominantly reflect the educational purposes of the learning system. Du Plessis (2005, p. 1380) further supports the complicated nature of an educational system by defining the quality of the pedagogical process, or teaching process, not as the quality of discrete factors, but as a transactional relationship between lecturer and student, aspects of which are also defined by the character, talents, and motivations of the student, the recipient. As teaching and learning form an emotional connection between lecturer and student, it is implied that teaching cannot be assessed by a single dimension of quality. There is no direct cause-and-effect relationship between teaching and learning, or between quality and teaching (Du Plessis 2005, p. 1381). To progress from good teaching to effective learning, the pedagogical process needs to refocus on student- and concept-centred learning. To do this, the curriculum has to be adapted to a demand-driven, interdisciplinary, and contextualised purpose through stakeholder participation. In this manner, teaching excellence is measured by how well the intellectual capacity of students has been developed.

Another source of scientific knowledge is university research and development. An outcome of social change based on enlargement is that mass HE is the social form of HE in the knowledge society (Trow 1974). It is also noted by Clarke (1983) that the key supply of social dynamics in HE is the expansion of knowledge. The logic of enlargement in research-based knowledge, number of students, staff, and HEIs is changing the social dynamics of HEIs and national systems of HE, as well as the relationships between them. Stehr (1994) postulated that there is a causal relationship between expansion of HE and the emergence of a knowledge society, because knowledge production supports growth in industrial production, and creates new business activities in knowledge societies. Knowledge, information, and knowledge production are significant features of relationships in a knowledge society. These relationships can be within and among societies, organisations, industrial production, and human lives.

There is a need to put universities in the centre when conceptually designing national systems of innovation, positioning universities as the key to knowledge production. In crafting universities that can create knowledge, quality output, and quality graduates with relevance to the needs and demands of economic, social, political, and technological change, scientific breakthroughs and lifestyle- and behaviour changes, are critical. The socio-economic system and the university sub-system in the context of developing economies need to be integrated to enhance quality output, as well as research and training. The NSI and triple-helix perspectives permit the linking of universities that carry out research with the wider economy, state, and society. The important question is how the knowledge produced by the university is managed to meet the social goals in the context of the evolution of the particular NSI (NSI 2011).

University R&D is an eminent source of scientific knowledge with a dominant impact. This knowledge is channelled to regional innovation systems through the teaching and training of students, which, in turn, may also improve the absorptive capacity of the private sector, which will result in improved innovative performance (Fritsch & Slavtchev 2006, p. 2). Such channels are:

- Co-operation in R&D with the private sector;
- providing innovation-led services;
- becoming an incubator for knowledge-intensive spin-offs;
- publications;
- workshops; and
- informal relationships.

Knowledge creation, flows and commercialisation (knowledge spillovers) from universities positively affect technological change and economic growth. Regional economic performance is determined by a well developed knowledge (Mueller 2006, p. 1506). A university's contribution is limited to the university's vicinity, which signifies the importance of spatial proximity. The intensity and quality of research at universities (which are dependent on external funds) are important, due to their contribution to the innovation system, not the institutions size. Using systemic thinking (analytical and synthetic) in critical self-evaluation of performance as a cornerstone of quality assurance

in HE, the study considered the adoption of innovation within the transactional relationship of all the diverse parts, as described in the conceptual framework depicted in Figure 8.

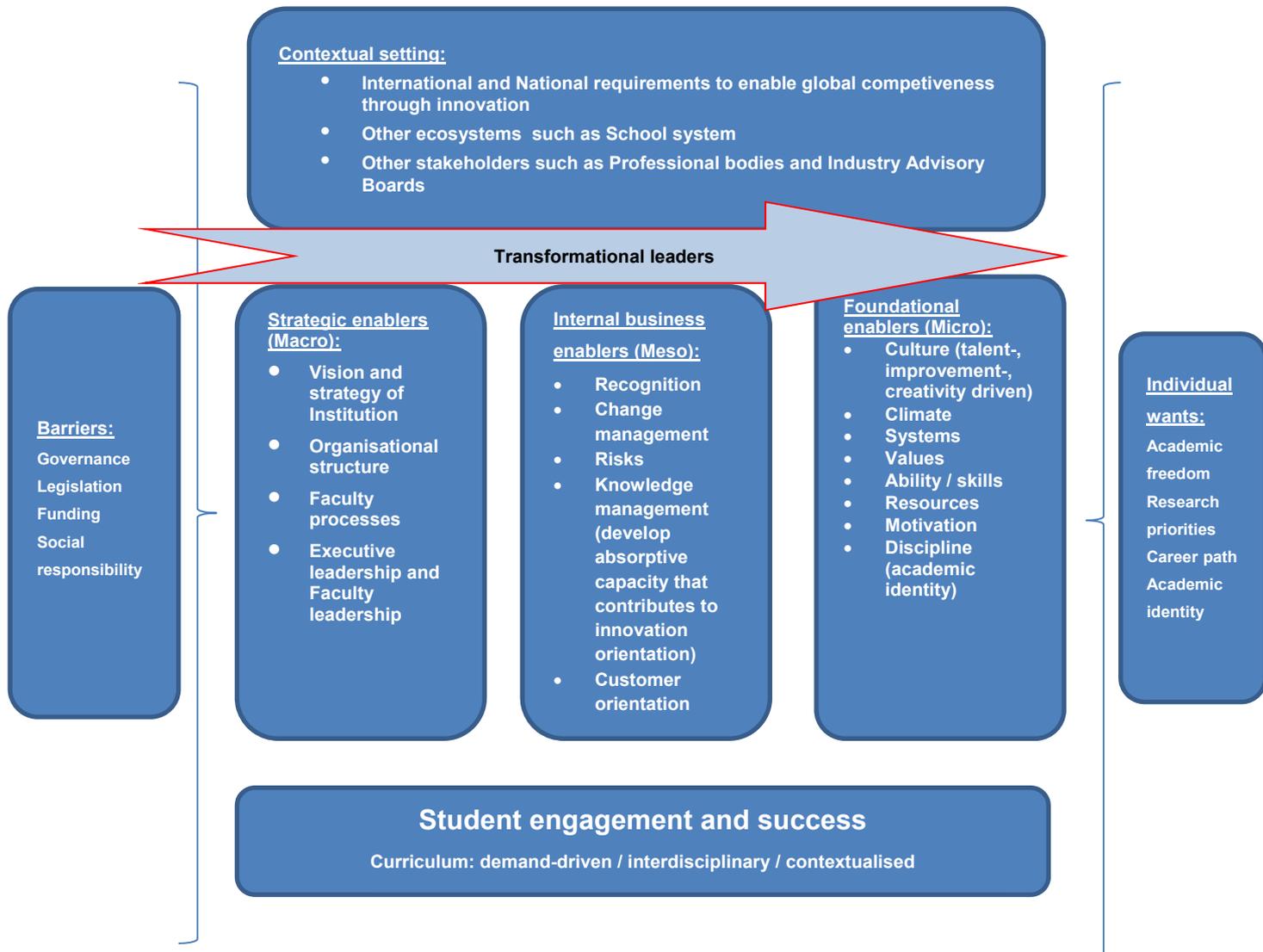


Figure 8: Conceptual framework.

Source: (Own compilation).

The interaction of the internal institutional parts with the larger HE environment and other external creative and innovative stakeholders are used to describe the fuzzy, complex, and on-going learning and innovation adoption process (Deiser 2010, p. 50). The following specific research objectives are defined:

Primary objective:

To analyse the concept of innovation adoption within a HE context, factors impacting on the adoption process, and the relationships between the identified phenomena, without explaining the reasons behind these relationships.

Secondary objectives:

- Understand how academia makes sense of innovation and the adoption thereof;
- Construct perspectives about innovation adoption in the institutional functions, as reflected in the institutional strategy;
- Explore the relevant organisational characteristics that foster employees' entrepreneurship, leading to innovation adoption, and how members of the institution respond to these characteristics in order to maximise innovation adoption;
- Explore how the creative process/capabilities vary in the institution (routines and processes);
- Interpret the *When?*, *Why?*, and *How?* of innovation adoption in the functions of the institution;
- Identify and interpret the critical enablers of and barriers to innovation adoption;
- Identify how the absorptive capacity of the individual affect the outcome in terms of innovative performance, e.g.:
 - Are certain disciplines more conducive to innovation than others?
 - Are some types of work experience more important than others, such as work experience achieved in the same sector compared to work experience achieved in other sectors?
- Explore polarities between the institutional intent to adopt innovation and the economic alignment of the HE sector with SA's human resource needs.

These objectives echo the sentiments of Drucker (Drucker 1999), who differentiated between the How to and the Why? of getting organisations to do the right things, rather than doing things right. The rationale for completing this research is to contribute to greater insight into the changing paradigm of tertiary education, globally and in SA, in order to better manage innovation adoption in UP. Innovation is a continuous process (Ailin & Lingren 2008, p. 87) that is the key to working systematically with a long-term

perspective on societal needs and emerging research in science and technology, as well as systematically approaching the wider inclusion of stakeholders in strategy- and priority-setting processes (Rasmussen *et al.* 2010, p. 37).

1.11 SCOPE OF THE STUDY

The conceptual extent of the study, as depicted in Figure 8, is discussed in the following paragraphs. The study commenced with a description of the building blocks of innovation leading to change, followed by the contextual setting influencing the business perspective of UP.

An idea is the result of creativity, but becomes an innovation only when it can be transformed into something meaningful and concrete, be it in the form of goods or services (De Miranda *et al.* 2009, p. 532). This could either take place in the form of commercialisation or market diffusion, whether internally or externally orientated. Creativity drives human behaviour, and has become a key factor in a range of productive activities. The present study interprets creativity as a driver within the innovation-competitiveness ladder and its link to creative and successful innovation. Environment, structure, and leadership are fundamental to the creative process, and can either stimulate or inhibit it. The present study examines the effect of culture as an umbrella construct on the internal faculty and external institutional environment of HE. This would assist the researcher to make recommendations regarding the process of innovation adoption. The study also explores polarities and tensions between the institutional intention to adopt innovation and the economic alignment of the HE sector with SA's human resource needs.

1.12 OUTLINE OF CHAPTERS

The thesis consists of eight chapters, and uses the case-study research methodology. Case-study research methodology is defined as 'a research methodology based on interviews that is used in postgraduate thesis involving a body of knowledge' (Yin 1994,

p. 13), and is characterised by a focus on a phenomenon that has identifiable boundaries (Henning & Van der Westhuizen 2004, p. 41).

- Chapter 1 dealt with the theme analysis and formulation of the problem. A problem and purpose statement was formulated leading to research problem objectives (the goal is inductive theory building).
- Chapter 2 deals with the research methodology. The sections are:
 - Introduction
 - Purpose statement
 - Research objective
 - Primary objective:
To analyse innovation adoption within a higher education context and critically judge factors impacting on the adoption process and the relationships between the identified phenomena, without explaining the reasons behind these relationships.
 - Secondary objectives.

Chapters 3–6 contain the literature review, which discusses and reports on the body of knowledge pertaining to the constructs under investigation. Fundamental concepts related to the study are described, and relations are defined, as the foundation on which the ensuing reasoning is based. Concepts are analysed, showing how they manifest in the HE landscape. These concepts are:

- knowledge constructs;
- creativity, innovation, and change;
- factors influencing innovation adoption; and
- HE as the change territory.

Chapter 7 focuses on the interpretation and addressing of the research questions.

Chapter 8 contains the conclusion and recommendations.

1.13 DELIMITATIONS

Innovation in teaching and learning and research functions is imperative to meeting the expectations of stakeholders. The present study endeavours to understand innovation adoption within UP, given the expectations of different stakeholders, while attempting to manage polarities in the system. Data was collected:

- within SA;
- within the HE environment;
- at UP, a research-intensive university;
- focusing on nominations submitted for the recognition of innovation by the institution;
- from lecturers across most faculties as innovation by its nature is defined differently within each discipline, which has different views of its impact on an industry or an organisation's productivity, survival, growth and performance;
- focusing on undergraduate and postgraduate programmes across different disciplines;
- from innovation nominations for 2008, 2010, and 2012 (nomination for the awards are received every second year);
- not taking into account any form of ranking of individual nominees;
- only from voluntary participants;
- by means of in-depth, structured interviews, complemented by questionnaires and resource sampling; and
- with the objective of understanding social processes — therefore, there was no need for statistical representativeness.

1.14 CONCLUSION

The research aimed to contribute to the body of knowledge on factors affecting innovation adoption in a HE institution, by providing an inventory of possible factors. In developing the inventory, the researcher focused on academics innovation adoption behaviour, drawing on a literature review, interviews and secondary resources from the academics. The economic problem of competitiveness and survivability as a result of globalisation, was debated in Chapter 1. An innovation base-line position for SA was determined from various indicators highlighting SA's plight for investing in innovation through growing its'

knowledge-base. The complex relationship between innovation and knowledge creation was explored in Chapter 3 and 4, linking these concepts to excellence HE and training, in Chapter 6. Chapter 5 identified factors, in the literature, that influence innovation adoption. Chapter 7 reflect the data analysis and Chapter 8 reflects the conclusions and recommendations.

CHAPTER 2: RESEARCH METHODOLOGY

2.1 INTRODUCTION

Research into organisational innovation reflects the complexity of real business environments, and helps an organisation to adapt effectively to environment-induced changes. A state of equilibrium with its environment is a necessity for an open system's organisational effectiveness; focusing on one dimension of innovation at a time is problematic, as the dimensions intersect with and influence one another.

The present study aimed to identify which factors influenced academics' adoption of innovation in a higher education institution. The qualities of these factors and why and how they influenced the adoption process were documented and qualitatively analysed. These analysed descriptions and explanations answered the research question. Experience and its position within an individual's life-world are encapsulated in Husserl's (in Henning & Van der Westhuizen 2004, p. 9) famous words: 'It implies that every individual experience must be seen as embedded in and bearing the imprint of a conceptual world ... a world that is continually changing, shifting its horizons in past and future, a life-world, or 'Lebensveldt'. The quest for understanding these lived experiences lies in the in-depth inquiry and the theory that explains it (Henning & Van der Westhuizen 2004, pp. 1-7).

2.2 RESEARCH DESIGN AND APPROACH

The present research focused on the adoption of innovation in a higher education social setting, rather than on innovation per se. In the context of this research, *innovation adoption* was defined by the researcher as the adoption of an idea or a new behaviour in the institution, or the application of an idea in a novel situation that influenced the teaching, learning, and research functions. Innovation in this sense could be seen as a process, a service, a product, a practice, or the use of a technology. The researcher analysed the concept of innovation adoption within the national context in which academic institutions are embedded. The concept of innovation adoption was explored

from an interactive triple-helix perspective, encapsulating the university, students, academics, the SA economic setting, and the government’s perspectives and expectations, as it is embedded rather than explicit within the higher education context. The importance of the adoption of innovation was explored within the bigger SA context. The research explored the concept of innovation adoption, crucial to change, and individual variables, or combinations of contextual, organisational, and personal variables influencing innovation adoption in the key functions of the institution. The empirical data from participants that emerged from systematic comparative analysis, enabled a fuller and better understanding of the complexity of innovation adoption by academics. This study collected and analysed data from various sources as is reflected in Table 40.

Table 40: Analysis and data sources.

Level of analysis	What was analysed	How was it analysed
SA economic level	SA economic needs and scarce skills	Literature review
HE Level	Data regarding funding from Government Priorities set by Government	Analyses of Government documents
Institutional level	Data was analysed from the institutions strategic plan, performance indicators and institutional research (PAL report) on “How can UP academic staff be inspired to strive for and achieve excellence in research and in teaching and learning.”	Document analyses
Level of academics	Academics who participated in the innovation awards in the UP higher education setting. Through their participation factors were identified that influenced their innovation adoption behaviour, derived from their surroundings and their absorptive capacity, and how these influenced their innovative behaviour (PPA696 Research Methods:1–2).	Document analyses Survey Interviews

Source: Own compilation.

These qualitative inquiries, through their nature of relationship, led to an enriched explanation of the factors influencing innovation adoption by academics in the UP context.

This qualitative approach (paradigm), also known as exploratory research, inductive or formulative, used a case study method appropriate when looking for how and why a

phenomenon happens. The case study method makes it possible to reflect on the individual phenomenological perspective of innovation adoption. The key to using a case study is the proper division of the problem, the collection of systematic and reliable data, and a rational analysis of the information. An interpretive and constructivist study design was selected. Primary data for the research were collected from academics who participated in the Innovation Awards (criterion sampling), using a survey (qualitative) and documents submitted by these individuals relating to their innovation. From the questionnaire and documents, an interview protocol was designed. Interviews (qualitative), following the interview script, were conducted with lecturers (theoretical sampling) who were willing to participate.

To understand the processes and practices surrounding innovation adoption by academics and what factors affected these processes positively or negatively, it was necessary to clarify the context in which these innovations occurred. The data were analysed from the South African HE and the UP context.

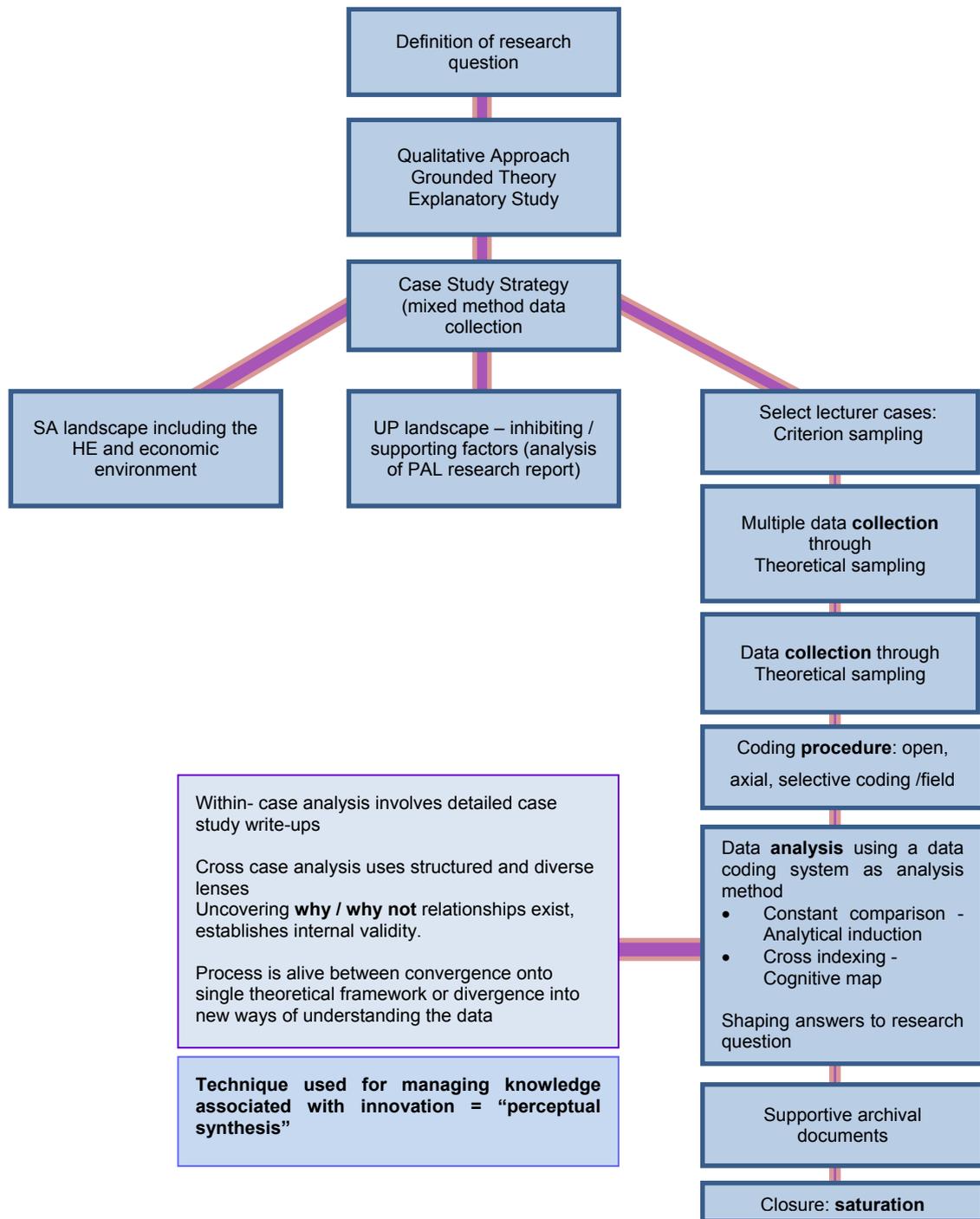


Figure 9: Summary of the research design and approach.
Source: (Own compilation).

2.3 RESEARCH PARADIGM/PHILOSOPHY

An interpretivist research paradigm was followed because of the flexible, context-specific (critical), and complex nature of innovation adoption by academics. The research explored and interpreted the innovation adoption motivations and experiences of academics in a HEI, and what external and institutional conditions allowed or did not allow innovation adoption. The basic assumption of this framework was that it is possible to understand and explain the complexity of human and social reality through the limited perceptions and introspection of the researcher, allowing for the subjectiveness of the researcher being part of the research process.

Such an understanding emerging through the interpretations of people would be different for every individual (Mlitwa & Van Belle 2010, p. 2). According to Downs and Mohr (1976, pp. 700-714), the innovation process is a very complex organisational occurrence. The complexity of the HE system and the challenges faced by the social actors in this multi-faceted context allowed for academics to construct meaning in relation to innovation adoption in different ways. The challenge in doing the present research was to try to understand innovation adoption from the subjects' perspective, given their unique set of circumstances and rich complexity. Generalisation of results in this study could be used to support and nurture future innovation adoption in UP by producing a plausible and coherent explanation of the phenomenon and how it needs to be supported.

Following an initial exploratory approach, the research endeavoured to better understand the way in which academics interpret their world by focusing on innovation adoption and its enabling and disabling characteristics. The factors that initiate and influence the adoption of innovation by academics were identified from a variety of data sources and analysis methods, in order to strive for triangulation. The complex context of HE necessitated a description of the academics':

- context within which the innovation adoption occurs;
- intentions and beliefs regarding innovation adoption;
- abilities to innovate and adopt innovation;
- reasons for adoption (motivational factors);

- value judgements;
- meaning-making; and
- self-understanding.

Enablers and barriers to innovation adoption were integrated to build a framework of innovation adoption by academics in UP.

What, why, where, and how academics adopt innovation was observed, evaluated, and described by analysing multiple interacting factors, events, and processes. By synthesising the findings and developing an understanding of the subjectivity and uniqueness of individual cases, knowledge regarding the adoption of innovation within higher education was constructed, leading to a better comprehension of how to enable and support it within the research context. The meaning arrived at is a function of the context, circumstances, the academics involved, and the broad interrelationships in the case being researched.

2.4 ENQUIRY STRATEGY AND BROAD RESEARCH DESIGN

Universities are pluralistic organisations with loosely coupled systems (Jarzabkowski 2003), and research on such a pervasive and open phenomenon lends itself to the use of case studies when studying change (Johnson-Cramer *et al.* 2003; Van de Ven & Poole 2005). An exploratory case-study strategy was undertaken to investigate the innovation adoption phenomenon of academics, as enacted in the innovation awards process in the context of UP. A case-study strategy was chosen because it is a collection of perceptions of ‘inconspicuous world phenomena,’ such as perceptions that are not apparent (Hunt 1991). The academics in the research sample could be viewed as ‘positive deviants’, defined as entities that engage in distinctive answers to be successful, in spite of inflexible circumstances that others in similar situations fail to overcome. Faced with such intractable challenges, they managed to succeed, with the same resources as others (Allio 2011, p. 32). The deviants’ process of adoption was observed, in order to allow the rest of the academics to learn and adopt such deviant behaviours. The confirmatory case study research approach is depicted in Figure 10.

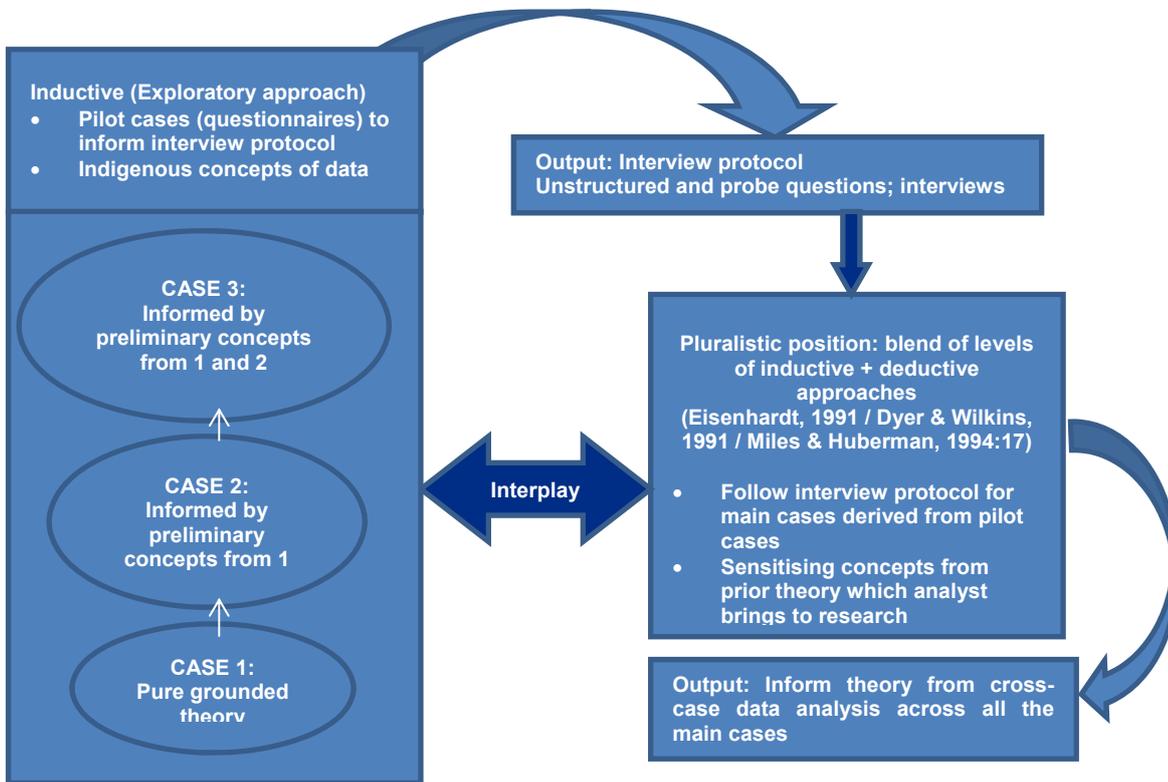


Figure 10: “Confirmatory” case study research.

Source: (Adapted from Perry 1998, pp. 785-790).

The systematic research method explains the subject of the research — innovation adoption — through the analysis of data. The method started with the collection of data, as is depicted in Case 1, Case 2, and Case 3. Using such an exploratory approach, Case 1 informed Case 2, while both Cases 1 and 2 informed Case 3. From the data derived from these pilot cases, an interview protocol was developed, containing unstructured and probing questions that were used during the interviews. The interview protocol was then used for the main cases. Through this inductive reasoning, probable explanations regarding factors influencing innovation adoption at UP were generated from cross-case data analysis of all the main cases.

Yin (2003, p. 1) confirms the use of a case-study strategy when appropriate, as case studies attempt to clarify a conclusion or collection of conclusions regarding ‘Why?’, ‘How?’, and ‘What?’ The characteristics of case studies are linked to this research in the following table.

Table 41: Integrating Yin’s approach regarding case studies with the present research.

Yin’s approach regarding case studies	Integrated into current research
Humanistic phenomena	How do real-people, academics, create meaning from innovation adoption?
Type of research question	Aims to understand / interpret human behaviour
Real life context	Higher education institution
Contemporary event	Adoption of innovation
How and why questions	To analyse innovation adoption within a Higher Education context and critically judge factors impacting on the adoption process as well as the relationships between the identified phenomena, without explaining the reasons behind these relationships (See secondary research question(s))
Researcher’s control over behaviour and/or events	Researcher not part of adoption decision or adoption process
Illuminates a decision	What, where, why and how innovation is adopted in Higher Education Institution
Multiple data collection methods	Documentation (stable; unobtrusive; exact; broad coverage) Archival records (stable; unobtrusive; exact; broad coverage; precise) Questionnaires Interviews (targeted; insightful)

Source: (Yin 2009).

2.5 PARTICIPANTS IN THE STUDY

Every second year, UP acknowledges exceptional contributions to education innovation by academics through the Innovation Awards. In order to generate a sample to address the research questions, nominees for the Innovation Awards were selected, as they could provide in-depth information, and the researcher could learn the most from these cases. The researcher studied a random sample of subjects who had been nominated as “innovation adopters” through this process. The sample was made up of academics from diverse faculties who were willing to participate and had the time to share their experiences. The selection of academics included individuals of all ages and from all levels, including new staff and staff with a long tenure with the university. Several years of these innovation nomination cycles were incorporated into the study, leading to a longitudinal time horizon (three cycles).

For the awards, nominees are required to submit evidence of an innovative development potentially resulting in improvements in the quality of the student learning environment.

'Innovation' can include the development of new practices or products and/or modification or adoption of existing practices or products within a discipline or across faculties within the university or in the community (Terms of Reference, Innovation Awards). Standard good teaching practice should convincingly have been exceeded, and evidence of sustainability, positive impact, and acceptance should be provided in the form of student feedback or appraisal by peers. The nominations should be based on a reflective practice informed by research. These nominations are open to UP academic staff with teaching appointments, as well as all academic support staff at UP. Both individual and team nominations are invited. Previous winners are eligible for the nomination of novel contributions in following cycles. Candidates may self-nominate, but all nominations needs to be recommended by the dean of the faculty where the candidate is employed, or, in the case of support services, by the director of the department. The nominations then need to be directed to the Director: Department for Education Innovation, where nominations are put through a stringent double-blind peer evaluation process, overseen by an external moderator.

The evaluation of submissions is done according to a rubric (see Table 42) that was developed in an attempt to decrease subjectivity in the evaluation of the submissions, and to allow for the diversity of faculties (a faculty-based approach). Comprehensive feedback is given to participants. The rubric is referenced to the original letter of invitation sent to the university community, and submissions are assessed on evidence they provide in relation to the following criteria:

- Intent: clarity of purpose through systematic planning, implementation, and evaluation;
- Impact on learning: influence on student learning and student engagement; and
- Impact on teaching practice: contribution to establishing best practice and/or widespread recognition.

The ruric for evaluating submissions during the awards process is given in Table 42.

Table 42: Rubric for UP Innovation Awards.

Criteria	Weighting	Recognition	Certificate	Possible Laureate
Intent	20 %	Purpose is vague, with no clear alignment between the different elements i.e. the broader context, the identified needs/gaps and the aim of the innovation to optimise teaching & learning.	Purpose is clear, with acceptable alignment between the different elements i.e. the broader context, the identified needs/gaps and the aim of the innovation to optimise teaching & learning.	Purpose is clear, with strong alignment between the different elements i.e. the broader context, the identified needs/gaps and the aim of the innovation to optimise teaching & learning.
Impact on student learning	40 %	The influence of the innovation on student motivation and learning is not yet evident. Innovation needs more time to determine sustainability and impact on student learning.	Anecdotal evidence that the innovation influenced, motivated and inspired student learning. Limited proof that the innovation is sustainable in improving student learning.	Significant evidence that the innovation influenced, motivated and inspired student learning over a sustained period of time. Significant evidence that the innovation can be replicated.
Impact on teaching practice	40 %	The innovation's contribution towards best teaching practice is unclear. Altered practices have not yet indicated how it attempts to address challenge(s) within the learning environment.	The innovation contributes to best teaching practice in the candidate's immediate/department/faculty's teaching and learning environment. Acceptable instructional practices that were developed respond to teaching and learning challenges within the learning environment.	Innovation significantly contributes to best teaching practice in the discipline and the UP teaching and learning environment. Exceptional and innovative instructional practices that respond to the teaching and learning challenges within the UP learning environment.
Criteria of category		<ul style="list-style-type: none"> vague purpose with no clear alignment student motivation and learning is not yet evident. sustainability not proven influence not yet evident identified challenges not shown 	<ul style="list-style-type: none"> purpose is clear with acceptable alignment anecdotal evidence is provided of influence on student learning. limited evidence of sustainability anecdotal evidence of contributions to teaching & learning practice limited evidence that the innovation addresses the identified challenges 	<ul style="list-style-type: none"> purpose is clear with strong alignment significant evidence is provided of influenced on student learning significant evidence of sustainability Significant evidence of contribution to best teaching practice in the discipline and the UP teaching and learning environment significant evidence that the innovation addresses the identified challenges

Source: (Innovation Awards Rubric 2008).

A double-blind peer-review process is applied to evaluate and rank all submissions, following a double-blind assessment methodology. Each submission is independently evaluated by an Education Consultant (EC) and an Instructional Designer (ID) from the Department for Education Innovation, as well as two independent faculty representatives, nominated by the faculty. The ranking of each nomination is submitted to an external moderator, who then decides on the final mark for each submission. The external moderator has the final decision-making power on the ranking of submissions. As the evaluation process is a peer-review process, the external moderator elevates the objectivity of the evaluations.

In peer-assessing nominations against the selection criteria, the evaluators take into account:

- the contextual and discipline-specific circumstances;
- demonstrated evidence of the acceptance and sustained impact of the innovation on the effectiveness of the module/programme in formal and informal evaluation; and
- the degree of creativity or uniqueness.

An audit trail is kept of the evaluation process and the rankings, so that formative feedback can be given to participants who were not successful, and need to mature or extend their innovations to qualify for the next round of Innovation Awards. All the different stages of the vetting process are documented.

The announcement of the winners of awards is made public at an awards ceremony. Nominees receive different forms of recognition according to the three categories (of Recognition, Certificate, and Laureate), as stipulated in the advertised call for nominations. The recommendation of the external moderator is final, and the evaluators cannot enter into any correspondence with participants regarding rankings.

These nominations are open to all academic staff with teaching appointments, as well as all academic support staff at UP (with the exclusion of Department for Education Innovation staff, who act as evaluators of the nominations); therefore, the data is suitable and valid, and covers the defined population, UP. As Merriam (1998, p. 202) states in qualitative research 'reality is holistic, multidimensional and ever-changing'. The fundamental principles of qualitative research are grounded in the fact that validity is an issue of trustworthiness, utility as well as dependability. This is put in place by all the stakeholders. It is the responsibility of the researcher and research participants to build validity into the different phases of the research. The rigour of the nomination and evaluation process contributes to the validity and reliability of the data set. Nominees' perception of the experience was captured and interpreted.

2.6 DATA COLLECTION

The initial selection of participants' perceptions produced preliminary theoretical explanation before further data were collected. The relationship between sampling and explaining the phenomenon was iterative and theoretically led. The study followed an iterative process of sampling and analysis, as depicted in Figure 11.

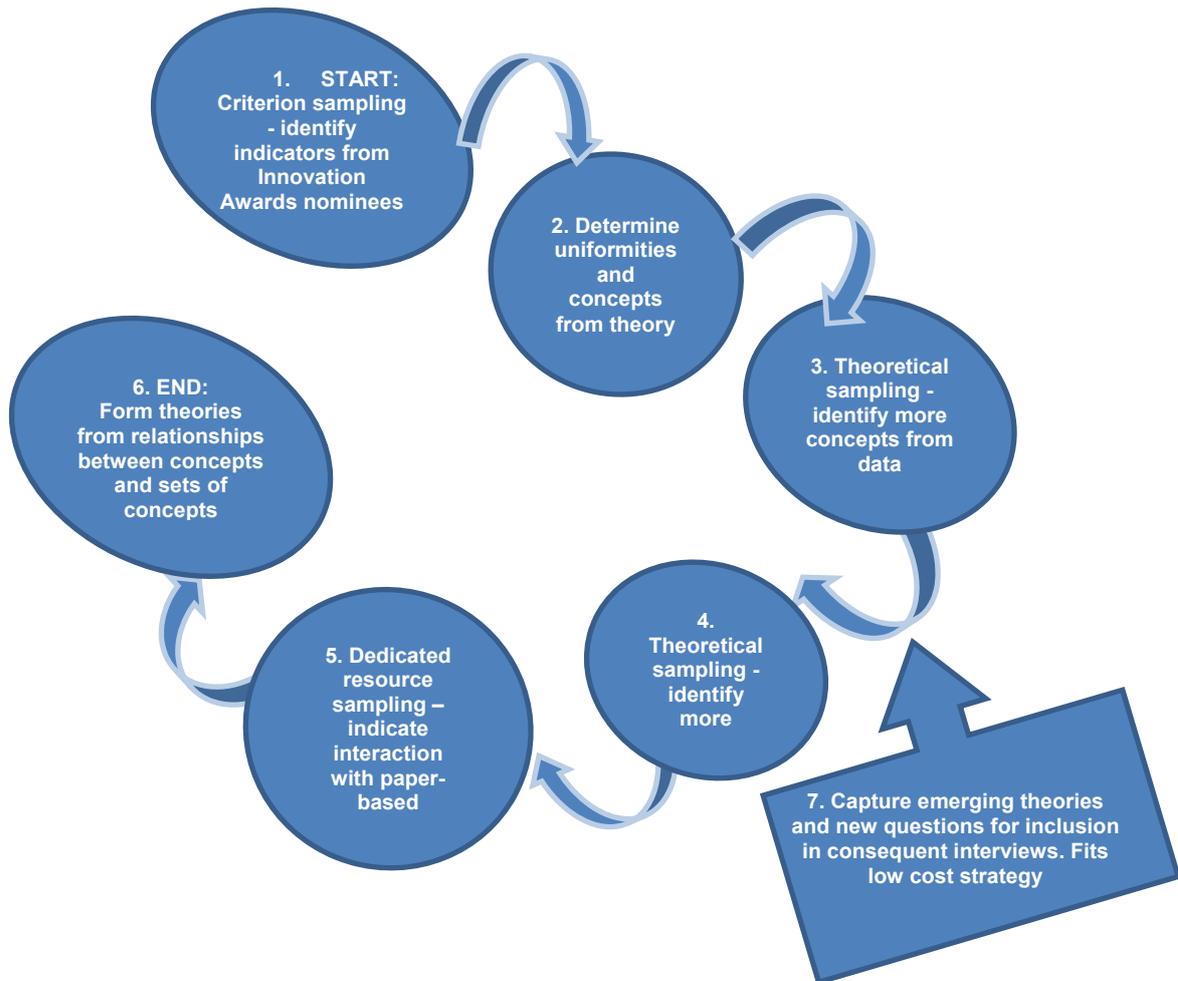


Figure 11: Sampling and analysis process.

Source: (Own compilation).

The steps in Figure 11 can be explained as follows:

- 1 Criterion sampling was used to identify the academics who would participate in the study. The predetermined criterion used for selection was the

academics' participation in the Innovation Awards process within UP.

- 2 In the literature study, the research concepts that influence innovation adoption were identified.
- 3 and Theoretical sampling is a rigorous method of analysing qualitative data in
- 4 order to determine more factors that influence innovation adoption. New cases were selected and compared to these.
- 7 New factors were identified from the cases analysed.
- 5 Through dedicated resource sampling, data from academics were compared to paper-based information.
- 6 Theories were informed from relationships amongst concepts and sets of concepts.

Data were collected through questionnaires and individual interviews with each nominee, according to a predetermined list of questions to steer the interview. The data collected during the initial sessions directed the resource sampling of video-taped presentations done by the nominees as part of the evaluation process for the Innovation Awards. This was complemented by analysis of the written submissions made by each nominee, which described and positioned their innovation nominations. A summary of the data collection method is given in Table 43.

Table 43: Data collection methods of this research.

Instrument	Target	By Whom
Interpret questionnaires and personal interviews (targeted; insightful) Word-for-word transcription not needed – capture only the essence needed to explain innovation adoption. Conceptualisation of concepts / hypotheses.	All selected nominees	Researcher
Independent analysis by nominee as part of the interview process	All selected nominees	Nominees
Refer to questionnaire. Surveys can and have been used for research on absorptive capacity at the organisational level. Using surveys requires developing an empirical concept of absorptive capacity. Popular proxies are: R&D; organisational structure and practices; HR and knowledge management; labour productivity and conformance quality. (Schmidt, 2005:2-3). Absorptive capacity is flexible and can be used for different units of analysis and different fields of study (Schmidt,2005:1)	All selected nominees	Researcher
Interpret video footage of presentations of nominations.	All selected nominees of 2010 (the 2008/2012 nominees were not video-taped)	Researcher
Analyse submitted documentation (nomination form) Provides stable, unobtrusive, exact and broad coverage.	All selected nominees	Researcher
Archival records - provides stable, unobtrusive, exact / precise and broad coverage.	Selected nominees	Researcher
Interpret Institutional documentation e.g. policy	When needed	Researcher
Literature analysis – apply comparative analysis technique	When needed	Researcher

Source: (Own compilation).

2.7 DATA CAPTURING AND ANALYSIS

The process of data capturing and analysis was documented. The data capturing was done using field notes, supported by cognitive mapping indicating the relationship between concepts. Transcripts of interviews capturing the essence of innovation adoption were added to the field notes to ensure comprehension. Innovation adoption practices of selected nominees of the 2008, 2010, and the 2012 group (the awards are given every second year) were analysed separately ex post. This was necessary, as the schooling system in SA changed in 2008 to an 'outcomes-based approach', and this might have influenced one of the most important variables involved in an academic's work, namely the students attending their classes.

Understanding the theoretical and practical dynamics of educational practices of educators, as well as the context-specific and unpredictable social factors (e.g. feelings,

beliefs, and motivations), requires an understanding of qualitative phenomena. Qualitative research uses a naturalistic approach in trying to understand a phenomenon in a context-specific setting, without the researcher manipulating the phenomenon of interest. Qualitative data-analysis procedures were followed to build a descriptive framework that was adequately grounded in the data. A qualitative enquiry is not theory-driven, but data-driven, with varying views of data, from objectivist to subjectivist (socially constructed) (Henning & Van der Westhuizen 2004, p. 47). In the present study, the data was categorised and unitised, to recognise relationships before reaching any conclusion. Theoretical comparison helped to control bias, and to enhance objectivity, while retaining sensitivity.

2.8 CONCLUSION OF RESEARCH METHODOLOGY

The methodology to address the problem statement aimed to critically appraise up-to-date knowledge, which also included significant findings and theoretical and methodological contributions to the subject of innovation adoption, specifically focusing on a HE context. These secondary sources presented a summary of current literature relevant to the research question, presented in an unbiased and comprehensive way, forming the basis for this research.

2.9 QUALITY AND RIGOUR OF THE RESEARCH DESIGN

According to Wisdom *et al.* (2013, p. 1), not much has been established about factors associated with innovation-adoption decisions and how the probability of innovation adoption can be augmented. Theoretical frameworks have focused on the dynamic process of the implementation of innovations. The goal of the present research was to identify factors that influence innovation adoption, with consideration of implementation, diffusion, dissemination, and/or sustainability (Wisdom *et al.* 2013, p. 1). In a theoretical review of 20 frameworks by Wisdom *et al.* (2013), the factors of leadership; organisation size and structure; innovation fit; norms, values, and attitudes; together with motivation, are mentioned in half of the frameworks. The precise definition and measurement of these constructs necessitates further effort.

2.10 SIGNIFICANCE OF THE STUDY

Multiple instances of innovations and innovation attributes were studied in this qualitative case study, and could significantly contribute to the advancement of the empirical knowledge base, as the study utilised replicable measures of innovation attributes and data gathered from participants in the process. The motivation for this study was to determine if a finite number of perceived characteristics are persistently associated with innovation adoption and implementation across diverse situations and technologies within an HE institution. Institutional policies, facilities for teaching and learning, learning policies, and educational paradigms and pedagogies inform usage and non-usage of innovative tools and methods in a department, faculty, or academic institution. This study could serve to inform and focus such policies and paradigms, or direct further research. Recognising and rewarding innovation adoption in the institution could be extended and enhanced.

Organisations aim to channel and restrict the behaviour of individuals, to maintain order and conformity. This expected and established routine is maintained so that the organisation can realise its objectives and get the job done efficiently and on time (Levitt 2002, p. 137). HEIs are no different, and are heavy with layers of bureaucracy, policy, and procedures; they have a tradition of collegial decision-making. Such a centralised approach hampers the ability to initiate change, and thus suffocates and obstructs educational innovation. Universities need to move to a much-needed customer-focused 'learning' environment where institutionalisation of innovation results in productive and responsive behaviour (Murray 2008, pp. 52-53). Levitt (2002) advises encouraging creativity, leading to concrete innovation, as this mitigates the complexity and rigidity of organisations. To enable change, a distinction needs to be drawn between abstract creativity and the concrete implementation of innovation. Responsible ideas that are action-orientated and systematically followed through with calculation of risk, costs, resource requirements, and time are more likely to be converted into innovations. The question is then how to move beyond the conformity and rigidity of a HE institution, which stifles creativity, by using its important attributes to facilitate innovation and encourage people to take risks.

Universities in SA, a developing country, can by no means distance themselves from the public. Reushle and McDonald (2010) accentuate the importance of acknowledging distinct systems that enrich each other. Innovation is a powerful way to accelerate the pace of change in a global, competitive environment, and such transformation requires profound examination of curricula. Curricula need to be considered primarily for their relevance and suitability in meeting national and social demands (Venter 2003). Academic engagement should lead to the creation of an energetic and knowledgeable populace and communities. According to Henry (1999), communities should cultivate creativity and capitalise on globalisation. In a world where people move across cultural and national borders, learning needs to be culturally relevant, articulated according to the intricacy of diversity.

HE is a decisive mediator in the development of innovation potential in SA, and is therefore a favourable business environment for such innovation to be created. Many governments have reduced their direct funding of universities, or are in the process of substantially doing so. McBurnie (2001, p. 11) argues that 'competition will lead to improved service, as those providers best able to efficiently and effectively satisfy clients, will prove more successful'. It is thus important for universities like UP to improve on the traditional educational approach by embracing globalisation.

Creativity and innovation are essential constructs for the survival and advancement of organisations and society. One of the most vigorous forecasters of an organisation's innovativeness is the occurrence of boundary spanning: where notions belonging to a domain, discipline, or functional area are introduced into another in such a way that new problems are resolved or new solutions are offered (Joyce *et al.* 2010, p. 57). Boundary spanning needs two or more experts to collaborate. Creative collaboration continues to be one of the most desirable behaviours, which managers and organisations should support. Some organisations have remodelled physical spaces to encourage different business units to mingle. It remains a trend for individuals to mainly interact with people similar to themselves, and to only discuss shared information. By encouraging and structuring social interactions, individuals from different fields can, together, produce more technically specialised and relevant ideas (Joyce *et al.* 2010, p. 57).

The present research focused on the adoption process of educational innovation by individuals and teams who contribute actual innovation, involvement, and substance to higher education. Those who do not do so are not driven by the same energy, and it is these underlying difference that yields change. The value of the present research lies in the identification of enabling and disabling factors in facilitating the optimal and germane adoption of innovation, and thus influence the:

- advancement of UP global ranking and recognition of academic superiority (with a focus on the nature, design, and development of academic programmes and curricula);
- improvement of the graduates' educational profiles, to make them locally relevant and responsive to the country's economic requirements (reflected in employer satisfaction and professional accreditation; such an approach is characterised by problem-driven, application-orientated, trans-disciplinary science, taking place outside of the university (Rasmussen *et al.* 2010, p. 37);
- development of the innovation potential of each graduate (which will ensure future funding for the institution, as innovative capacity is a much-needed driver of the South African economy);
- enhancement of the teaching, learning, and research functions of the institution
- maintenance of effective innovation networks that impact on the cycle of innovation adoption;
- improvement of policy and processes, leading to institutional reforms to give recognition to innovation adoption; and
- in the case of UP, delivery on actions stipulated in the 2008 audit recommendations in preparation for the forthcoming audit, in 2014.

2.11 RESEARCH ETHICS

To protect the participants from harm, both physical and psychological, ethical clearance was obtained from the faculty's Ethics Committee (see Appendix C). Furthermore, all participants who wished to participate in the research study signed an Informed Consent

Form, informing them of the purpose of the study, that they could withdraw at any time, without penalty as well as the contact details of the supervisor (see Appendix D).

The participants' identities will be kept confidential, as the research findings are reported anonymously. At all times, the privacy of participants was honoured, and they were not subjected to embarrassment or material disadvantage.

The researcher undertook to report data that were valid. Participants were free to withdraw from the study at any time, without penalty.

2.12 ABBREVIATIONS OF TERMS

Table 44: Abbreviations and terms used and their meaning, quoted from dictionaries, textbooks, and literature.

Ability fit	Comparison between abilities required by the innovation and a person's current abilities
Academic Department	Department structured around an academic discipline for example Accounting, Business Management.
Academic freedom	<p>Academic freedom is the belief that the freedom of inquiry by faculty members is essential to the mission of the academy as well as the principles of academia, and that scholars should have freedom to teach or communicate ideas or facts (including those that are inconvenient to external political groups or to authorities) without being targeted for repression, job loss, or imprisonment.</p> <p>Academic freedom is a contested issue and, therefore, has limitations in practice. In the United States, for example, according to the widely recognized "1940 Statement on Academic Freedom and Tenure" of the American Association of University Professors, teachers should be careful to avoid controversial matter that is unrelated to the subject. When they speak or write in public, they are free to express their opinions without fear from institutional censorship or discipline, but they should show restraint and clearly indicate that they are not speaking for their institution.[1] Academic tenure protects academic freedom by ensuring that teachers can be fired only for causes such as gross professional incompetence or behavior that evokes condemnation from the academic community itself.[2]</p>
African National Congress (ANC)	<p>The ANC is a national liberation movement. It was formed in 1912 to unite the African people and spearhead the struggle for fundamental political, social and economic change.</p> <p>For ten decades the ANC has led the struggle against racism and oppression, organising</p>

	<p>mass resistance, mobilising the international community and taking up the armed struggle against apartheid.</p> <p>The ANC achieved a decisive democratic breakthrough in the 1994 elections, where it was given a firm mandate to negotiate a new democratic Constitution for South Africa. The new Constitution was adopted in 1996.</p> <p>The ANC was re-elected in 1999 to national and provincial government with an increased mandate.</p> <p>The policies of the ANC are determined by its membership and its leadership is accountable to the membership.</p> <p>Membership of the ANC is open to all South Africans above the age of 18 years, irrespective of race, colour and creed, who accept its principles, policies and programmes.</p> <p>Aims and Objectives</p> <p>The ANC`s key objective is the creation of a united, non-racial, non-sexist and democratic society.</p> <p>This means the liberation of Africans in particular and black people in general from political and economic bondage. It means uplifting the quality of life of all South Africans, especially the poor.</p> <p>The struggle to achieve this objective is called the National Democratic Revolution.</p>
An individual's affective response	'Belief in a particular innovation and willingness to exert considerable effort in its implementation'
An individual's affective response	'Belief in a particular innovation and willingness to exert considerable effort in its implementation'
ATLASTI	Software package to analyse qualitative data
Audit Report	Report reflecting a systematic check or assessment, especially of the efficiency or effectiveness of an organisation or a process, typically carried out by an independent assessor
Bail-outs	A situation in which a business, individual or government offers money to a failing business in order to prevent the consequences that arise from a business's downfall. Bailouts can take the form of loans, bonds, stocks or cash. They may or may not require reimbursement.
Birap	Bureau Institutional Research and Planning
brain drain	Human capital flight, sometimes also called brain drain, refers to the emigration of intelligent, well-educated individuals to somewhere for better pay or conditions, causing the place they came from to lose those skilled people, or "brains." Typically, emigrating brains have learned English and have moved to the United Kingdom, the US or some other English-speaking country. An example is Albert Einstein. Brain drain is common in developing nations, particularly in former African colonies of the United Kingdom,[1] the island nations of the Caribbean,[2] and in centralized economies such as the former East Germany and the Soviet Union. China and India have recently been discovered to be at the top of the list of countries with skilled students of English leaving.
BRIC	Acronym for the developing countries of Brazil, Russia, India, China

BRICS	Acronym for the developing countries of Brazil, Russia, India, China and SA
CEatUP (Continuous Education at University of Pretoria)	<p>As skills development is becoming critical for survival in a rapidly changing business environment, CE at UP also present specialised courses on Performance Management and How to Develop a Work Skills Plan (WSP) to help you manage and implement your organisation's WSP proactively. Continuing Education at University of Pretoria (CE at UP) strives to empower through education. We endeavour to be the leading training and career development partner of the commercial and government sectors in Africa. Since our inception in 2000, our short learning programmes have equipped people with the right tools and knowledge to accelerate their personal and career development in a sustainable and meaningful manner.</p> <p>2015 marks 15 years since CE at UP's inception. During these 15 years, we have trained in excess of 260 000 delegates from more than 61 countries. Leveraging our affiliation with the University of Pretoria, we have offered 500+ short courses and have illustrated our commitment to truly make a difference in the lives of individuals and to institutions, both within the private and public sectors.</p>
CeSTID	Centre for Science, Technology and Innovation Indicators
CHE	Council for Higher Education
CHET	Council for Higher Education Transformation
CIT	Critical incident technique used for research
Climate	The situation or atmosphere that prevails at a particular time or place in an organisation, inferred by members of the organisation
Community outreach	<p>The University renders a broad spectrum of services to communities in its immediate environment, as well as nationally. Together with its teaching and research, the University has initiated or participates in many community programmes. These range from service learning to civil responsibility programmes and are largely directed at development. Many are based in academic departments, while others are initiated by students. - its active and constructive involvement in community development and service. This category includes all study programme modules that are presented to the community as part of a degree or can deal with academic development, such as the student mentoring programmes and the Foundation Year Programme, which aim to increase the number of black students from previously disadvantaged groups in the sciences. The School of Engineering also introduced an extended study programme, stretched over five years instead of four years, with the aim to create an alternative access route for students who show the necessary potential to succeed academically, but who are at risk of failure due to their disadvantaged educational background. New intellectual challenges are created through community engagement and new interdisciplinary insights are developed. Community engagement stimulates also service learning as it impacts on academic programmes, creates new teaching ideas and opens up new fields for research.</p>
Constructive alignment	Constructive alignment is based on two principles of constructivism in teaching and alignment on learning.

Constructivism	A teaching system that aligns teaching methods and assessment with the learning activities stated in the objectives, so that all aspects of this system are in accord in supporting appropriate student learning.
Culture	Culture can be distinguished as either explicit, in the sense of patterns of behaviour by people or implicit in the sense of, values, beliefs, norms and premises
Dean	Senior member of the academic staff of a university who manages the whole faculty
DEI	Department for Education Innovation, a teaching and learning support service to all the academic faculties within the University of Pretoria
Demand-ability fit	Extent to which a person has the ability to meet the demand of the job (meeting needs of others)
Demands–abilities fit (D–A fit)	Occurs when people have the skills, knowledge, and abilities that are required by their environment, as in the case of fit between abilities required by an innovation and those possessed by an individual.
Department of Research and Innovation Support (DRIS)	<p>The Department of Research and Innovation Support (DRIS) plays an enabling role in the University of Pretoria’s vision to be recognised as a leading research-intensive university in Africa. It fulfils its role by integrating people, resources and opportunities that make it possible for researchers, at every stage of their career, to develop and excel. From accessing funding and supporting emerging researchers, through to contract writing and the protection of intellectual property, DRIS provides a creative and supportive environment in which researchers at UP, and from across South Africa, the region and the international research community, can contribute to the impact of research on the well-being of society.</p> <p>The DRIS portfolio is structured to comprise five sections:</p> <ul style="list-style-type: none"> Research Support Office Research Contracts and Innovation Office International Programmes Research Grants Management Graduate Support Hub
Dissemination	The spreading of knowledge or research, such as is done in scientific journals and at scientific conferences. Making research available through traditional vehicles.
Economic disparity	Economic disparity is a situation permitting the existence of the illegal economy nexus (state fragility, illicit trade, organised crime and corruption) and should be challenged at an organisational level. A long-term strategy is to invest in global education, equipping populations with the knowledge and skills to contribute fully to economic activity, as well as trying to correct organisational unemployment.
Education Consultant	Academic adviser who works in a faculty and gives advice regarding teaching and learning issues to academic staff
EDUCAUSE	Journal for education related publications
Emerging market	Nations with social or business activity in the process of rapid growth and industrialisation and where politics matter at least as much as economics, are categorised as emerging markets. This business trend is not fully described by or constrained to geography or economic strength (Wiki-pedia). Currently, there are 28

	emerging markets in the world, with the economies of China and India considered as being by far the two largest. Such countries are considered to be in a transitional phase between developing and developed status It appears that emerging markets lie at the intersection of non-traditional user behaviour, the rise of new user groups and community adoption of products and services, and innovations in product technologies and platforms.
Employability skills	Set of achievements that comprise skills, understanding and personal attributes that make an individual more likely to secure and be successful in his/her chosen occupation to the benefit of him/herself, the workforce, the community and the economy.
EMS	Faculty of Economic and Management Sciences
Engagement framework	Framework within which Support Service interact with Academic Departments in University of Pretoria
ESI	Essential Science Indicators database
EU	European Union
Faculty	Education division of a university – a department or group of departments dealing with a particular subject in a university or college
FDI	Foreign Direct Investment
FTE	Full-time equivalent
GCI	Global Competitive Index.
GDS	Growth and Development Strategy
GERD	Gross public expenditure on research and development
GGA	Generic graduate attributes
Global governance	Global governance is the political interaction of transnational players intended to resolve challenges where compliance is not imposed and many regions are affected. The complex of formal and informal institutions, mechanisms, relationships, and processes between and among states, markets, citizens and organizations, both inter- and non-governmental, through which collective interests on the global plane are articulated, Duties, obligations and privileges are established, and differences are mediated through educated professionals.
HE	Higher Education
HEI's	Higher Education Institutions
HEQC	Higher Education Quality Council
HESA	Higher Education South Africa
IMF	International Monetary Fund.
Implementation behaviour	An individual's consistent and committed use of a particular innovation'
Innovation generation	Phrase used by the University of Pretoria to refer to their student population (generation x and generation y)
IP	Intellectual Property
ISI	Institute for Scientific Information
Knowledge Management	Knowledge Management involves creating, securing, coordinating, combining, retrieving and distributing knowledge

Knowledge Transfer	'A systematic approach to capture, collect and share tacit knowledge in order to transfer it to become explicit knowledge. By doing so, this process allows for individuals and/or organisations to access and utilize essential information, which previously was known intrinsically to only one or a small group of people'.
Knowledge Translation	'The exchange, synthesis and ethically-sound application of knowledge – within translation a complex system of interactions among researchers and users – to accelerate the capture of the benefits of research through improved health, more effective services and products, and a strengthened health care system'.
Leadership	Position of the head of a body of people – the ability to guide, direct, or influence people
MIT	Massachusetts Institute of Technology
NDP	The National Development Plan (NDP) is a strategy through 2030 published in August 2012 and endorsed by cabinet a month later. It was produced by the National Planning Commission (NPC), an entity created by the president in 2010 to undertake a critical analysis of the country's performance since the transition to democracy and develop a long-term plan for the country.
NES	National Enterprise Survey: a low-cost, comprehensive survey of employees that covers 10 dimensions of the employee experience.
Net Generation	Generation born in or after 1982
NGP	The New Growth Path (NGP) is an economic framework for the period 2010-2020. It was developed by the Economic Development Department (EDD). Like the NPC, the EDD was established after the 2009 general elections. Shortly after its creation, the department was tasked with the creation of a new economic plan to replace the Accelerated Shared Growth Initiative for SA (AsgiSA), which had been criticised for failing to deliver jobs and reduce inequality
NLRD	National Learners Records Database
NQF	National Qualifications Framework
NSI	National System of Innovation
OECD	Organisation for Economic Co-operation and Development promotes policies to improve the economic and social wellbeing of people around the world.
Organisation	Higher Education Business
Pedagogical	The science or profession of teaching including teaching strategies, techniques or approaches that teachers use to deliver instruction or facilitate learning
Pedagogical design	Pedagogical design is an ongoing process that deals with how to use resources in an effective way in order to scaffold students' learning processes
Person–environment (P–E) fit	A good fit between people and their environment (e.g. job, organization, vocation) on relevant dimensions (e.g. task requirements, organizational culture, vocational characteristics) induces greater commitment
PGCHE	Post Graduate Diploma in Higher Education
PHD	Physical doctorate
PIRLS	Progress in International Reading Literacy Study
R&D	Research and Development
RDP	Reconstruction and Development Programme

S&T	Science and Technology System
SA	South Africa
SA NQF	South African National Qualification Framework
SADC	South African Development Community – 13 members.
SAQA	South African Qualifications Framework
SARAU	South African Regional Universities Association
SARUA	Student Action Research for University Access
SER	Student Engagement rate
SET	Science, Engineering and Technology
SETA's	Sector Education Training Authorities
Social design	Social design refers to a safe, comfortable space in which learners are willing to share and can easily communicate with others.
SSA	Sub-Saharan Africa
Supplies–values fit (S–V fit)	Which is present when the environment provides values that are compatible with a person's preferences or needs, as in the case of fit between innovation values and personal values
Supply rents	Portion of income paid to a factor of production in excess of that which is needed to keep it employed in its current use
Supply-value fit	Motives or needs of persons that match supplies in the environment with those motives. This involves individuals' evaluation of their environment based on personal values (meeting own needs).
Synthesis	A synthesis is an evaluation or analysis of research evidence and expert opinion on a specific topic to aid in decision-making or help decision makers in the development of policies.
TIMMS	Trends in International Mathematics and Science Study
UP	University of Pretoria
USPTO	United States Patents and Trademark Office
Value fit	comparison between innovation values and personal values
WBLMS	World Bank Large Manufacturing Organisation Survey
WBSMMES	World Bank Small Medium and Micro Enterprises
WEF	World Economic Forum
World Bank Institute	<p>Vision</p> <p>Across the globe citizens are demanding accountability and transparency from their governments. And access to information and technology through mobile phones and social media are multiplying opportunities for citizens to provide feedback—transforming the way we do development. This fast changing global environment is forcing the development community to adapt—to do development differently. It's no longer only about finance. It's about transparency in government, access to the latest global knowledge, and using innovative ways to solve development challenges.</p> <p>Strategy</p> <p>The World Bank Institute (WBI) supports the World Bank's operational work and its country clients in this rapidly changing landscape by forging new dynamic approaches</p>

	<p>to capacity development. WBI offers three areas of support to its developing-country clients:</p> <ul style="list-style-type: none"> • Open Knowledge: connecting them to global knowledge and learning on the “how” of reform, • Collaborative Governance: helping them to mobilize for collective action, and • Innovative Solutions: scanning and incubating innovations to tackle key development challenges. <p>Open Knowledge</p> <p>WBI connects stakeholders and development practitioners to global knowledge and learning—knowledge that is a source of inspiration and practical know-how, and that fosters ownership and galvanizes action. Our approach to Open Knowledge takes two forms, Structured Learning and Knowledge Exchange:</p> <ul style="list-style-type: none"> • Structured Learning: In fields where content is mature, WBI codifies global knowledge into training programs to help its clients master tested development know-how. In July 2011, WBI launched the Bank’s new virtual e-learning platform, the e-Institute. • Knowledge Exchange (KE): WBI supports peer-to-peer learning and helps broker knowledge exchanges among developing countries. WBI also encourages World Bank country teams to incorporate knowledge exchanges in country programs, and is promoting the Global Development Learning Network (GDLN) as a worldwide KE implementation platform. <p>Collaborative Governance</p> <p>Today, the World Bank can no longer work primarily with government officials alone. Successful development requires building multi-stakeholder coalitions. Collective solutions require effective and inclusive leadership as well as new forms of collaboration: for example, public-private partnerships for the provision of infrastructure, health, or education; citizen report cards to improve public service delivery; or mayors and civil society working together for climate change mitigation in urban centers.</p> <p>WBI offers four Collaborative Governance business lines:</p> <ul style="list-style-type: none"> • Open Government and Open Aid. • Capacity Building for Nongovernmental Actors. • Citizen Engagement through ICT. • Multistakeholder Collaborative Action. <p>Innovative Solutions</p> <p>Leveraging innovative technologies, WBI is developing tools, methods, and online platforms to facilitate an open and collaborative development process among governments, citizens, and other stakeholders. It does this in these key areas:</p> <ul style="list-style-type: none"> • Competitions and Challenges. • WB Innovation Labs. • Development Marketplace.
World Development Report	The Annual Report has been prepared by the Executive Directors of both the International Bank for Reconstruction and Development (IBRD) and the International

	Development Association (IDA)—collectively known as the World Bank—in accordance with the respective bylaws of the two institutions.
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Source: (Own compilation).

2.13 CONCLUSION

Chapter 1 highlighted that as a result of globalisation and connected economies all countries are punished when systemic frailties are revealed, as illustrated through the global economic crisis. Interconnected economies and competitiveness necessitates new policy frameworks to manage new economic challenges and address human resource development. SA's low rankings in the GCI, World Development Indicators, NSI and the National Scarce Skills List, human intellectual capability is sorely needed, to equip SA's population with the knowledge and skills to contribute fully to economic activity so they can work and live productively and to effectively manage risk as a response for innovation and growth.

By embracing the knowledge society SA has to attend to the discourse of labour economics (demand and supply) and address some of its local human resource challenges in order to be responsive to globalisation challenges.

CHAPTER 3: LITERATURE REVIEW - KNOWLEDGE

3.1 INTRODUCTION

Our future success depends upon mobilizing even more effectively the imagination, creativity, skills and talents of all our people. And it depends on using that knowledge and understanding to build economic strength and social harmony. (Department for Education and Skills 2003, p. 2)

There is a positive association between the monetary achievement of knowledge-based economies and the innovation and research priorities in their national agenda (HSRC 2006; Report on Measuring innovation in OECD and NON-OECD countries). In pursuit of a sustainable competitive advantage, organisations have heightened their quest for strategies to stay at the forefront by differentiating their products and services. Such continuous innovation is founded on effective and efficient knowledge management, which enables the organisations to stand out in knowledge creation (Popadiuk & Choo 2006, p. 302). Darr *et al.* (1995) and Nonaka (1991) relate knowledge-creation competence in a learning organisation to concepts such as absorptive capacity, insight generation, organisational learning and memory, as well as the structured knowledge management processes (Heinrichs & Lim 2006). In understanding the concept of being well educated in today's globalising economy, this chapter explores the causal constructs leading to the development of knowledge, and the process of constructing knowledge.

Knowledge as a capital asset can, like any other cumulative asset, be exchanged, managed, distributed, and marketed (Walsh 2013, p. 12). The classic definition of knowledge is the suite of defensible true philosophies or opinions, combined with reason, that intensifies an entity's ability and competency to effectively engage. (Nonaka 1994; Alavi & Leidner 2001). Additional versions of the classic definition are expressed in terms of three stipulations: the condition of acceptance or belief, the condition of justification or evidence, and the condition of truth.

In the Business Dictionary (<http://www.businessdictionary.com/definition>) the definition of knowledge is explained as: the human ability to interpret information, and develop insight from a combination of data, information, experience and personal understanding.

Knowledge in an organisational setting is defined as the sum total of what is comprehended by all of its people.

3.2 STRATEGIC POSITION OF KNOWLEDGE

The important role of knowledge in the economy was first acknowledged by Schumpeter, in 1911 (Cooke & Leydesdorff 2003, p. 57), in his reference to 'new combinations of knowledge' (existing and/or new components) at the core of entrepreneurship and innovation. He formulated the entrepreneur's role as not conforming to the conventional, but owning the competence to create 'new combinations' and to uncover new markets and persuade consumers to use such new innovations (Schumpeter 1934; 1996, pp. 65-66). Economic transformation or change is unremitting, and innovation constantly renews an area's economy, as is reflected in Schumpeter's words:

The essential point to grasp is that in dealing with capitalism we are dealing with an evolutionary process... the fundamental impulse that sets and keeps the capitalist engine in motion comes from the new consumers' goods, the new methods of production or transportation, the new markets, the new forms of industrial organisation that capitalist enterprise creates. (Schumpeter 1942, p. 82-85)

Acknowledging the significance of knowledge to features of the economy such as innovation, production, organisations and markets was also accredited to him.

Innovation diffusion and knowledge translation have many properties in common (Estabrooks *et al.* 2006, p. 33). Knowledge translation is outlined as dynamic and iterative processes that transfer research from the research entity (laboratories, journals and conferences) to the entities (people and organisations) that can apply the knowledge. This assortment of actions is dependent on the type of research, the time frame, and the audience being targeted. The processes comprise the application, synthesis, dissemination and exchange of knowledge.

The translation of knowledge in decision-making procedures uses complex knowledge (Straus *et al.* 2009, pp. 165-167). Strategies for knowledge translation may fluctuate according to the target audience and the type of knowledge. Knowledge is created and

used in three contexts: academic, policy, and action. Knowledge creation is composed of three phases considered as the foundation: knowledge inquiry (completion of primary research), synthesis of knowledge (bringing together disparate research findings), and the creation of knowledge tools (systematic reviews). They should be considered in totality, rather than as results of individual studies. This should happen in addition to the quality of the evidence. Gaps occur between evidence and decision-making (Strauss *et al.* 2009, p. 107). The knowledge-to-action framework in Figure 12 describes the procedure of actioning knowledge and offers an example for the procedure of knowledge translation.

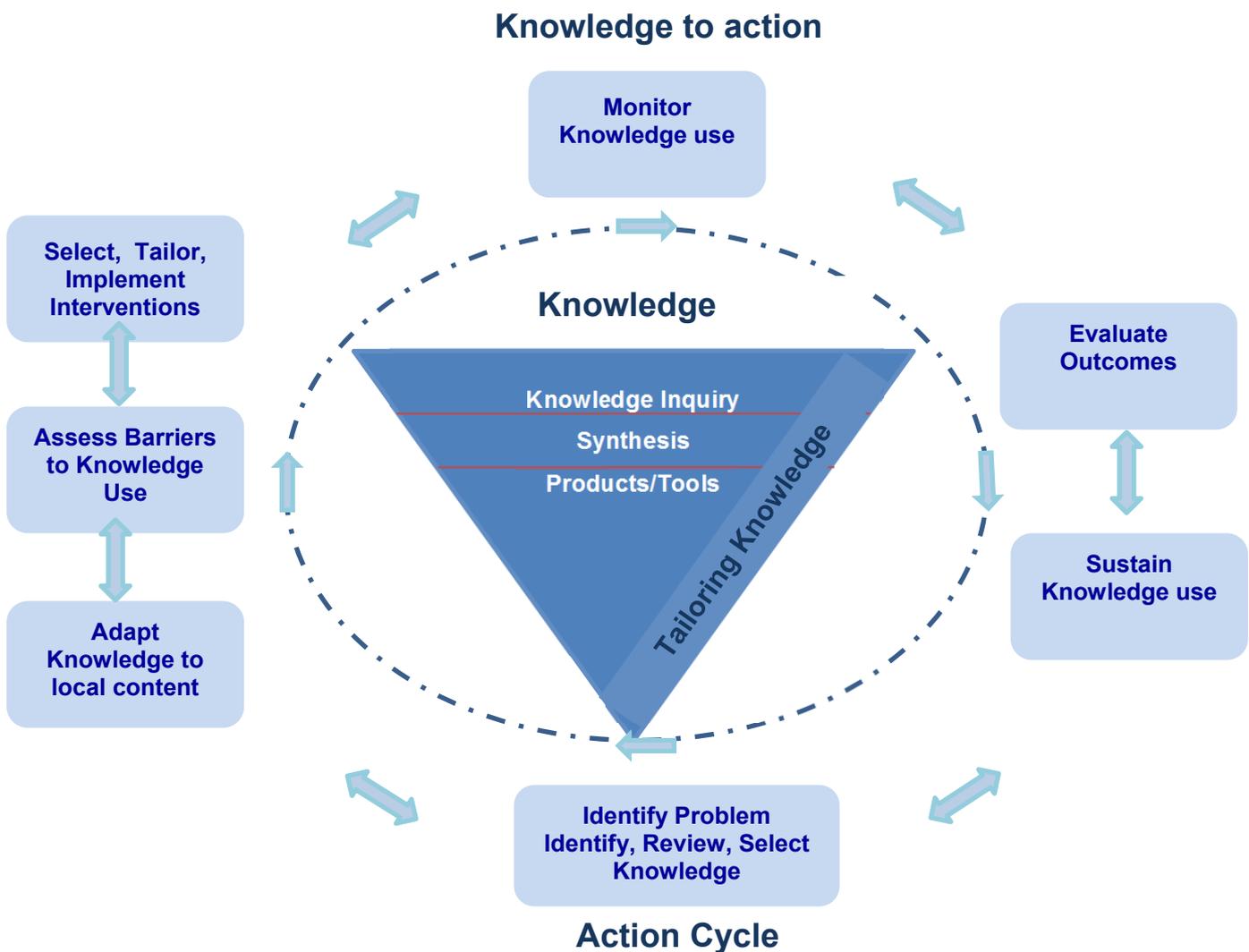


Figure 12: Knowledge-to-action framework.

Source: (Strauss *et al.* 2009, p. 167).

Competitive advantage can be sustained through scarce and not easily 'transferable or replicable' resources (Grant 1991). The most strategically important scarce resource that organisations possess to sustain development in a competitive globalised world is knowledge, tacit knowledge in particular (Schultze & Stabell 2004, pp. 550-551). The measures of progress for individuals, organisations, and entire economies are dictated by the current knowledge revolution. Organisations aptitude to generate, acquire, and suitably utilise knowledge puts them on the road to prosperity. Knowledge, being the breeding ground of innovation, is a weapon against cut-throat competition, and a tool for gaining strategic and competitive advantage. Innovation can achieve different results when put to different uses. Being the guiding light of sustainable development initiatives, as well as the kindling spirit of unsustainable growth mechanisms, knowledge is the means of improving the standard of living of men and women. The 1999 World Development Report states: 'For countries in the vanguard of the world economy, the balance between knowledge and resources has shifted so far towards the former that knowledge has become perhaps the most important factor determining the standard of living — more than land, than tools, than labour' (Siddiqui & Khan 2007, pp. 7-8).

Grant (1996, p. 376) reasoned that an organisation's competitiveness grows from its employees' expert knowledge to the capability of the organisation to produce new knowledge and innovation, and, finally, enabling strategic actions. Innovative organisations are defined by knowledge creation which is noticed as one of the principal resources of an organisation.

Learning is critical to such a society in terms of accommodation, assimilation and transformation, dependent on issues, context and conditions, and to individuals, organisations and nations in terms of new skill formations to be able to produce new knowledge. (Merx-Chermin & Nijhof, 2005:135).

Linking the quantity of novel knowledge to be developed and applied to the nature of new knowledge gives an indication that to which the innovation will lead. This linkage is plotted in Figure 13.

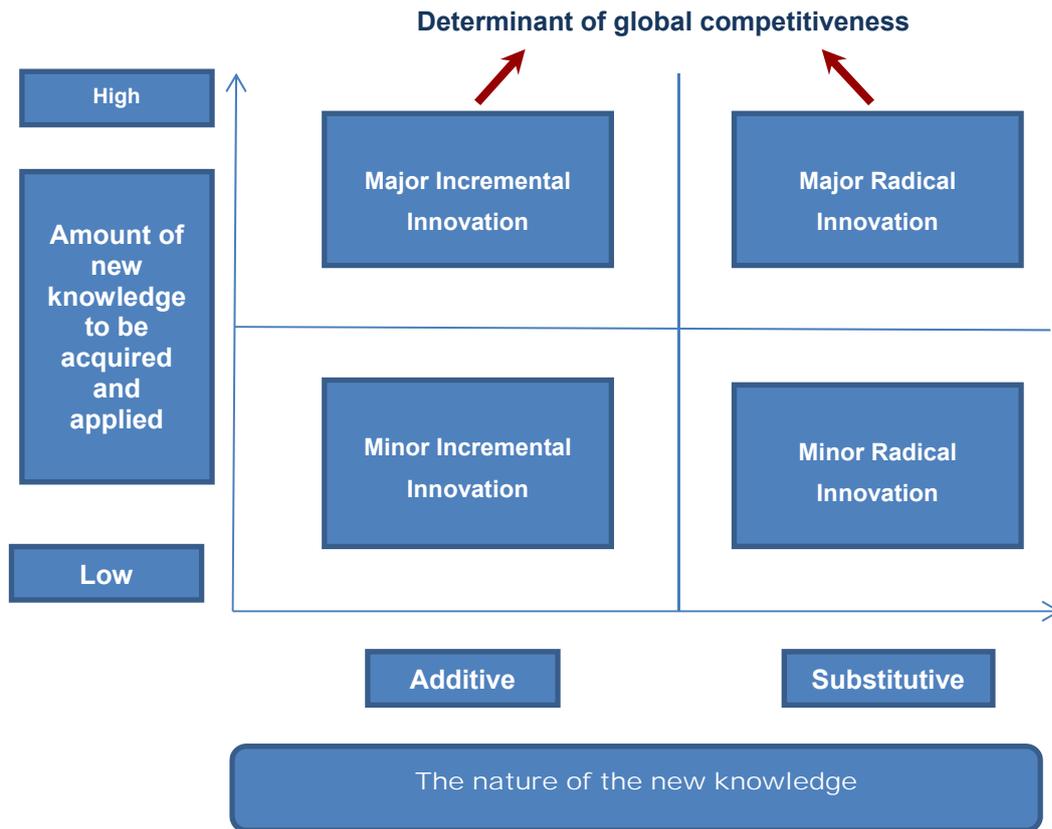


Figure 13: The “*innovation plot*”.

Source: (Hall & Andriani 2003, p. 149).

Knowledge is described as the new source of wealth: the intangible intellectual assets that have surfaced as a resource to be appreciated, expounded, and managed (Nicolescu *et al.* 2006). Due to the ‘innovation plot,’ high amounts of substantive new knowledge, leading to innovation, is becoming the determinant of global competitiveness. Globalisation, together with the technological revolution, has positioned knowledge and the intellectual drivers of competitiveness as the drivers of the global economy, conferring distinguishing benefits (Bratianu & Dinca 2010, p. 210). The global paradigm has shifted from an industry-based economy to an information-based economy. Such an economy is not one of scarcity, but rather of abundance, where value is added by creating, accessing, and using knowledge (Aubert *et al.* 2006, slide 6), as is described in Figure 14. The knowledge economy is one where knowledge is shared and grows by being applied.

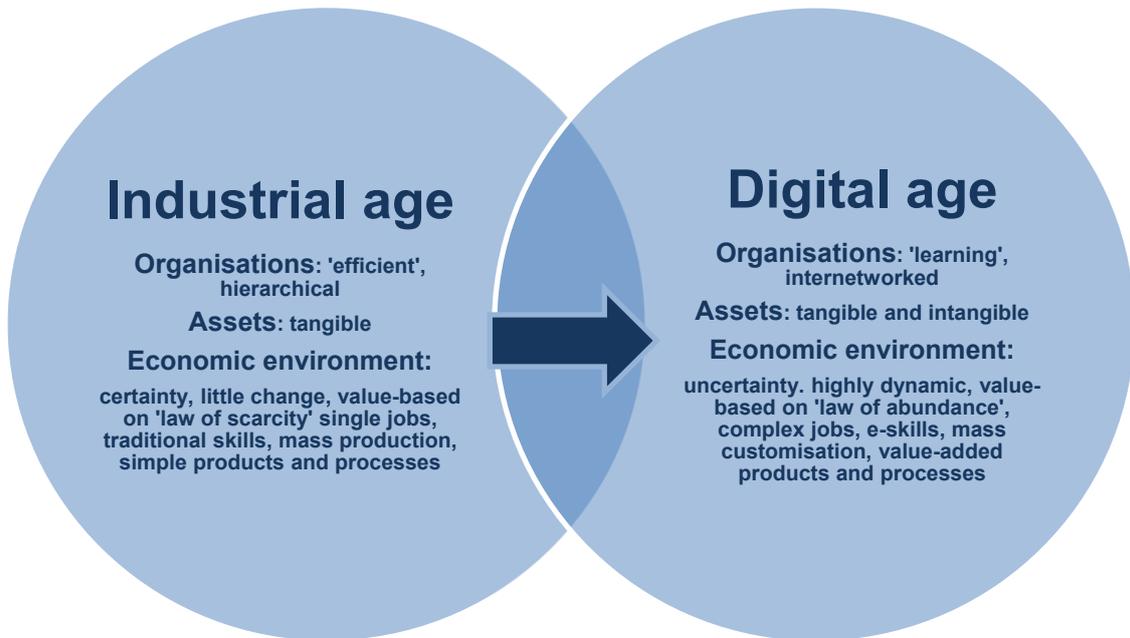


Figure 14: Industrial versus digital age characteristics.

Source: (Bratianu & Dinca 2010, p. 212).

The digital age critically links knowledge to economic performance (Aubert 2006, slide 11), which is realised through people, products, processes, and organisations by customising entities in order to maximise organisations' market value (Lee & Yang 2000, p. 786). Characteristics of the industrial society versus the knowledge society is given in Table 45.

Table 45: Characteristics of the industrial society versus the knowledge society.

	Industrial societies	Knowledge societies
Definition of knowledge	'Know-how'	Capacity to act
Forms of knowledge	Plural (traditional, embodied, embedded, etc.)	Abundant
Primary source of added economic value	Material inputs	Symbolic inputs
Principle of stratification	Access to capital	Access to knowledge
Orientation to the future	Acceptance	Planning, control, creativity
Power tendency	Centralising	De-centralising
Key motor of change	Technological innovation	Unexpected events
Key contradiction	Formal equality (democracy) versus actual inequality (capital / labour)	Knowledge as both response to, and source of, indeterminacy
Key threats	Scarcity	Fragility

Source: (Walsh 2013, p. 18).

Knowledge, being the source of innovation and creativity, includes aspects such as skills, organisational reputation and culture systematised theory, which have the ability to influence human thought and behaviour. Knowledge assets, therefore, create an assortment of challenges, as it is acquirable and renewable, intangible and abstract, entrenched in personal beliefs, experiences, and values, and poses questions around valuing it, managing it, containing it, maximising it, and processing it (Bogdanowicz & Bailey 2002, p. 125). Knowledge consists of equitable judgement and an intense understanding, and contributes to the empowerment and development of all segments of society (Burch 2005). This concept is further explored in this chapter.

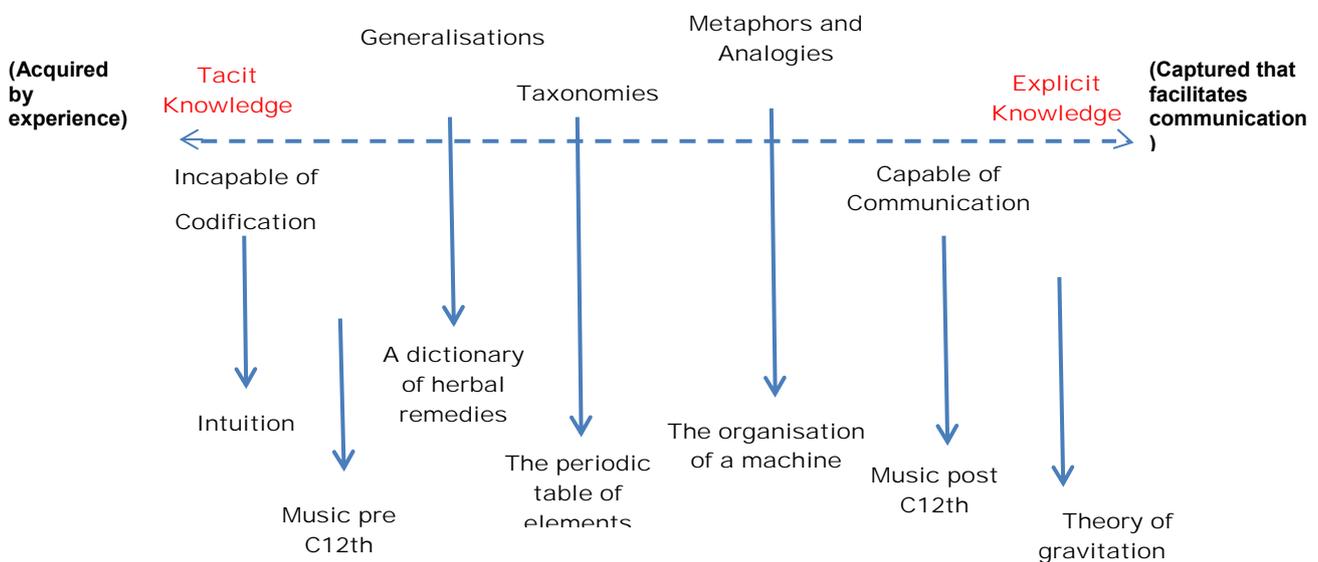
3.3 CONCEPT OF KNOWLEDGE

Hung *et al.* (2010, p. 426) define knowledge as professional intellect, while Alavi and Leidner (2001) define knowledge as meaning given to inert, static and disorganised information, by an individual. Knowledge, a defensible personal belief applied to justify one's own interest (Nonaka 1991), is a cluster concept, and, in this sense, is seen as 'a structural component from an economic perspective and is used to mean the confident understanding of a subject matter with the ability to use it for a specific purpose, if appropriate', Knowledge can also be defined as the sum total of our understanding and perception about nature and society (Lewis 1955, p. 164; Hayek 1960, pp. 25-26).

Information that is converted by the human mind through reading, understanding, interpreting, and which is being applied to an explicit work function, is defined as knowledge. This interpretation of information becomes visible when a knowledgeable human being puts into practice lessons learnt over time. In another view, 'information is a component of knowledge, which is a more all-encompassing term that also incorporates the concept of beliefs based on information and depends on the commitment and understanding of the individual holding these beliefs, which are affected by people's interaction and the development of judgement, behaviour and attitude' (Lee *et al.* 2000, p. 783).

Concepts are grounded in personal perspectives (Bhatt 2001), and information only becomes knowledge if it is interpreted correctly, connects to prior knowledge, and is applied to problems or decisions (Alavi & Leidner 2001). A network of relations is created when discrete data and information bits connect via a process of differentiation. The overall organisational patterns of the network of relations encompass the knowledge, and not the individual parts (Lee & Yang 2000, p. 783). In an individual, knowledge is created via cognitive processes (learning), while social systems generate knowledge through collaborative interactions (Smith 2003). Such socialisation represents interactions between individuals through observation, imitation, and apprenticeship (Key Concepts in Innovation 2011, p. 196). In the knowledge-creation process, raw data are transformed from internal or external sources into meaningful patterns of organised data, described as information.

The ability to expand the knowledge base depends on the level of learning and on the pre-existing knowledge base (Schwartz 2006; Cohen *et al.* 1990). The learning capability of an organisation is determined by two components: the prior knowledge base (accumulated knowledge) and the intensity of the effort (organisational and cultural arrangements) (Tang 2005, p. 22). The knowledge spectrum is given in figure 15.



Examples of categories of knowledge

Figure 15: The knowledge spectrum.

Source: (Hall and Andriani 2003, p. 146).

Knowledge could be encoded knowledge, not easily transferred (Kreiner 2002), called tacit knowledge, or represent shared goods and universally accepted and objective criteria, called explicit knowledge (Nonaka 1994; Cavusgil *et al.* 2003, p. 7; Arling & Chun 2011, p. 232). Distinguishing between these kinds of knowledge is fundamental to understanding organisational knowledge (Cavusgil *et al.* 2003, p. 7). Tacit knowledge is knowledge that has been converted into habit, but not yet translated into practice; it is highly context-specific, with a subjective quality, as it is learned through shared and collaborative experiences. It is either impossible or difficult to articulate (Nonaka *et al.* 2000), and is based on a persons' own feelings, experience and thinking within a particular context and includes components of a cognitive and technical nature (Nonaka *et al.* 2000). Learning tacit knowledge entails participation as well as doing.

Successful tacit knowledge transfer needs trust and a shared understanding, developed in a social and cultural contexts (Roberts 2007, pp. 429-443). Shared goals steer towards associations, making the exchange of knowledge and technology effortless (Foos *et al.*, 2006:8). Explicit knowledge is knowledge and skills and is transferred into formal, systematic methods (rules and procedures) found in company documentation such as standard operating procedures as well as information systems (Starbuck, 1992). Explicit knowledge is rule-based, articulated, organised and expressed through symbols (Nonaka & Takeuchi, 1995).

Additional classifications of knowledge include cultural knowledge, distinguished by Choo (1998) and alluded to by Nonaka and Takeushi (1995), that describes reality through assumptions and beliefs, is uncoded, and is disseminated through a groups' connections and relationships. Social knowledge refers to the collective actions of a group and guides intra-group communication and coordination. Another classification of knowledge by Alavi and Leidner (2001) is based on the usefulness of the knowledge to the organisation. Zack (1999) classified knowledge as procedural; causal; conditional and relational. The detail of these classifications are portrayed in Figure 16.

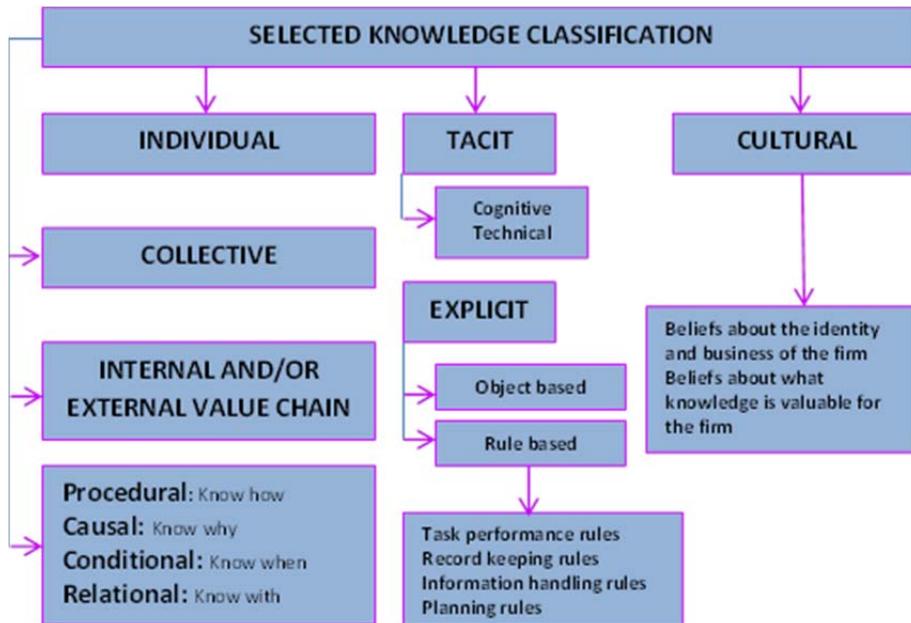


Figure 16: Categories of organisational knowledge.

Source: (Popadiuk & Choo 2006, p. 307).

Organisational activities and processes utilise knowledge as pivotal and a tactically significant resource of the organisation (Grant 1996). Knowledge that is unique and valuable is associated with organisational accomplishments and processes, taking account of the management of technology, organisational learning, and innovation (Cavusgil *et al.* 2003, p. 6). Understanding the cognitive processes leading to knowledge creation helps to reach a fuller understanding of innovation, perceived as changes or continuous improvements in business processes and entrepreneurial culture, which is constrained by the types of knowledge that exist in an organisation.

3.4 LEARNING AS A HUMAN ENDEAVOUR

Education, training, and experience lead to individual knowledge as a personal possession. Learning is a distinctly human endeavour, and a person's expansion of knowledge is a function of growth. Learning can be explained as the processing of information whereas the capacity to construct and assimilate external knowledge, is knowledge absorption (Cohen & Levinthal 1990; Kayes & Kayes 2005, p. 580). For new knowledge to be recognised, acquired and applied a foundation of prior and related knowledge is needed. Experience plays a significant part in knowledge acquisition. The

experiential learning theory of Kolb (1984, p. 38) proclaims that the alteration of experiences, which leads to the generation of knowledge, is the process of learning. The theory portrays learning as a transformation process turning experience into new knowledge. The cyclical process of learning is depicted in Figure 17 where experience acts as a base for reflective observation; abstract conceptualisation acts as a base for active experimentation; active experimentation heads another experience, starting another cycle. Language functions as the foundation for learning in the experiential learning theory of Kolb (Kayes & Kayes 2005, pp. 578-580).

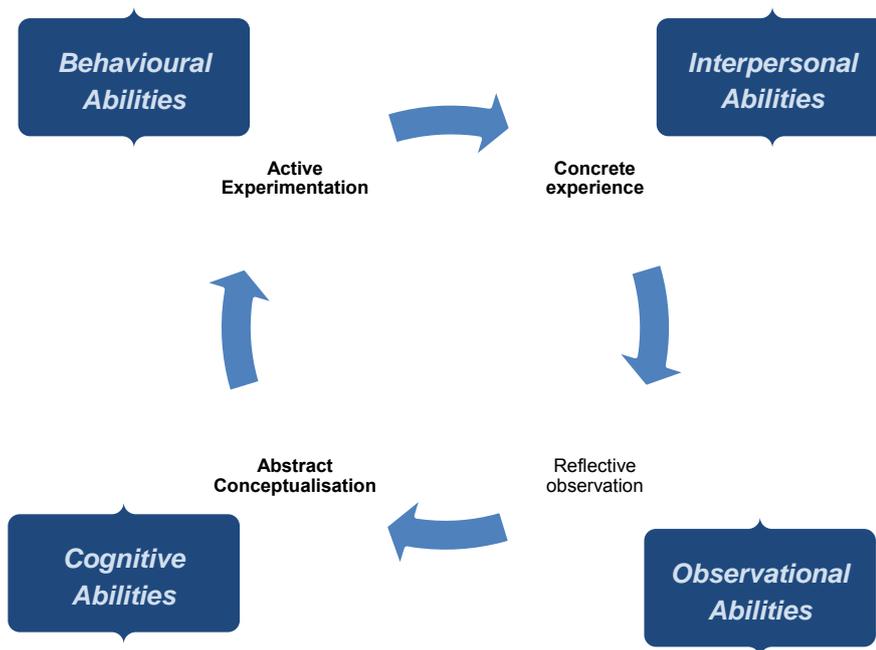


Figure 17: Kolbs' experiential learning cycle.

Source: (Kayes & Kayes 2005, p. 580).

As learning is a complex construct, other theories and models should also be considered, in order to gain a fuller understanding, as given in Table 46.

Table 46: Learning theories.

Theory/Model	Summary	Originator(s)
Behaviourism / Cognitivism	Rationalism / Socrates / Classical conditioning / Stages of cognitive development / Operant conditioning /	Socrates / Plato / Pavlov / Skinner(1938)
Social development / Humanism	Discovery and enquiry learning / Social learning theory; observation theory: attention, retention, reproduction, motivation/Social development theory / Situated cognition CCP	Bruner / Bandura / Vygotsky / Lave (1969–1991)
Constructivism / Post-modernism	Connectivity / Social, cognitive, connected schemata	Siemans / Sontag (1999–2000)
Problem-based learning	An instructional method of hands-on, active learning centred on the investigation and resolution of messy, real-world problems	Late 1960s at the medical school at McMaster University in Canada
Affordance theory	Theory that the world is perceived not only in terms of object shapes and spatial relationships but also i.t.o. possibilities of action (affordances): perception drives action	Gobson (1904–1979)
GOMS model	Human information processing model that predicts what skilled users will do in seemingly unpredictable solutions	Card, Moran and Newell in 1983, Bonnie John et al.
Discovery learning	Method of enquiry-based instruction; discovery learning believes that it is best for learners to discover facts and relationships for themselves	Bruner (1915)
Situated learning theory / Authentic learning	Posits that learning is unintentional and situated within authentic activity, context and culture	Lave
Attribution theory	Attempts to explain the world and to determine the cause of an event or behaviour	Weiner
Stage theory of cognitive development	Description of cognitive development as four distinct stages in children: sensorimotor, preoperational, concrete and formal	Piaget (1896–1980)
Multiple intelligence theory	Posits that there are seven ways people understand the world, described by Gardner as seven intelligences	Gardner (1983)

Source: (<http://www.learning-theories.com/category/learning-theories-and-models>).

Learning, a process with several diverse components, is more than knowledge acquisition. Various preparative activities, such as investigations and decision-making, are needed for entering into the learning experience. The act of learning can be viewed as the creation of an external network of nodes (external entities) – configuring information and knowledge sources. Siemens (2006) argues that learning grids can be understood as structures that exist in our minds, through which patterns of understanding are created and connected.

Learning in the digital age is explained by connectivism, driven by the comprehension that rapidly changing foundations inform decisions. The principles of connectivism are described in Table 47.

Table 47: Principles of connectivism.

Learning and knowledge require diversity of opinions to present the whole and to permit selection of best approach.
Learning is a network formation process of connecting specialized nodes or information sources.
Knowledge rests in networks.
Knowledge / learning may reside in non-human appliances, and learning is enabled / facilitated by technology.
Capacity to know more is more critical than what is currently known.
Learning and knowing are constant, on-going processes (not end states or products).
Ability to see connections and recognise patterns and make sense between fields. Ideas and concepts are the core skills for individuals today.
Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities.
Decision-making is learning. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality. While there is a right answer now, it may be wrong tomorrow due to alterations in the information climate affecting the decision.

Source: (Siemens 2004, 5).

The knowledge-absorption process needs specific individual competencies. A cross-cultural knowledge absorption competencies model integrating cross-cultural competencies research, experiential learning as well as knowledge absorption is given in Figure 18 (Kayes & Kayes 2005, pp. 578-582). This model suggests that four sets of competencies are required, identified by prior cross-cultural learning research (Yamazaki & Kayes 2004). These competencies need to align and be considered with the values of a specific culture, the host environment (Yamazaki & Kayes; 2004).

KNOWLEDGE CONTENT	KNOWLEDGE PROCESSING	
		Internal
		External <u>GATHERING</u>
New	Listening and observing	Valuing different cultures Building relationships
	<u>APPLYING</u>	<u>ORGANIZING</u>
Extant	Translating complex ideas Taking action	Coping with ambiguity Managing others

Figure 18: Cross-cultural knowledge absorption competencies.

Source: (Kayes & Kayes 2005, p. 582).

As a result of the social and technological evolution, an underlying mismatch exists between the pursuance and the delivery of education and the context and characteristics of knowledge, preparing learners for a past era (Siemens 2006, p. 1). Traditional learning theories come from an era without prominent technologies. Learning has changed because of overwhelming knowledge growth whereby technology has replaced many basic tasks previously performed by people.

3.5 ORGANISATIONAL LEARNING AND KNOWLEDGE CREATION

Strategic management views organisational learning as a fundamental source of competitive advantage (Campbell & Armstrong 2013, p. 243). Organisational learning is a vague concept and a complicated process. that alludes to the enlargement of novel knowledge with the impending possibility of changing both individual and organisational behaviour (Huber 1991; Slater & Narver 1995; Murray & Donegan 2003). Jones (2000) defines organisational learning as 'a process through which managers try to increase organisational members' capabilities in order to better understand and manage the organisation and its environment' (Jones 2000, p. 472). Organisations exhibiting a sound learning culture have a tendency to create, acquire and transfer knowledge. These organisations are strong in amending behaviour, manifesting in new knowledge as well as insight (Huber, 1991; Garvin, 1993). Consequently, organisations desiring an organisational learning culture (OLC) need to first gain information, make sense of it, transform it into knowledge and then implement behavioural and cognitive changes.

Numerous attempts have been made to define organisational learning. Senge (1990:6) defined organisational learning as 'a continuous testing of experience and its transformation into knowledge available to a whole organisation and relevant to its mission', while Huber (1991) explained it as a mixture of information that is acquired, distributed, interpreted and organisational remembrance. Schön (1996) postulated that knowledge materialises when organisations acquire any kind of information (knowledge, understandings, know-how, techniques and procedures). Dimovski (1994) summarised preceding research and merged informational, interpretational, strategic and behavioural

approaches in his model. He defined organisational learning as a process of gaining information, interpreting such information so that it will result in behavioural and cognitive changes impacting on the performance of the organisation. Effective organisational learning is a forceful process including sharing, negotiating and validating that confronts existing understanding and promotes individual diversity and formulates shared consensus (Campbell & Armstrong 2013, p. 244).

Organisational learning culture has evolved from only a competency understanding to also include the process element, while connecting learning opportunities and organisational behaviours. Organisations with a competitive advantage have the capacity to learn and respond to internal and external business environments. (Skerlavaj *et al.* 2006, pp. 346-367). An organisational learning culture improves organisational performance, by creating a space where employees can repetitively learn and share their knowledge. Organisations are more effective if all these components are in congruence, and organisational learning is integral to achieving and maintaining such a fit (Campbell & Armstrong 2013, p. 242). A model of the process of organisational learning is displayed in Figure 19.

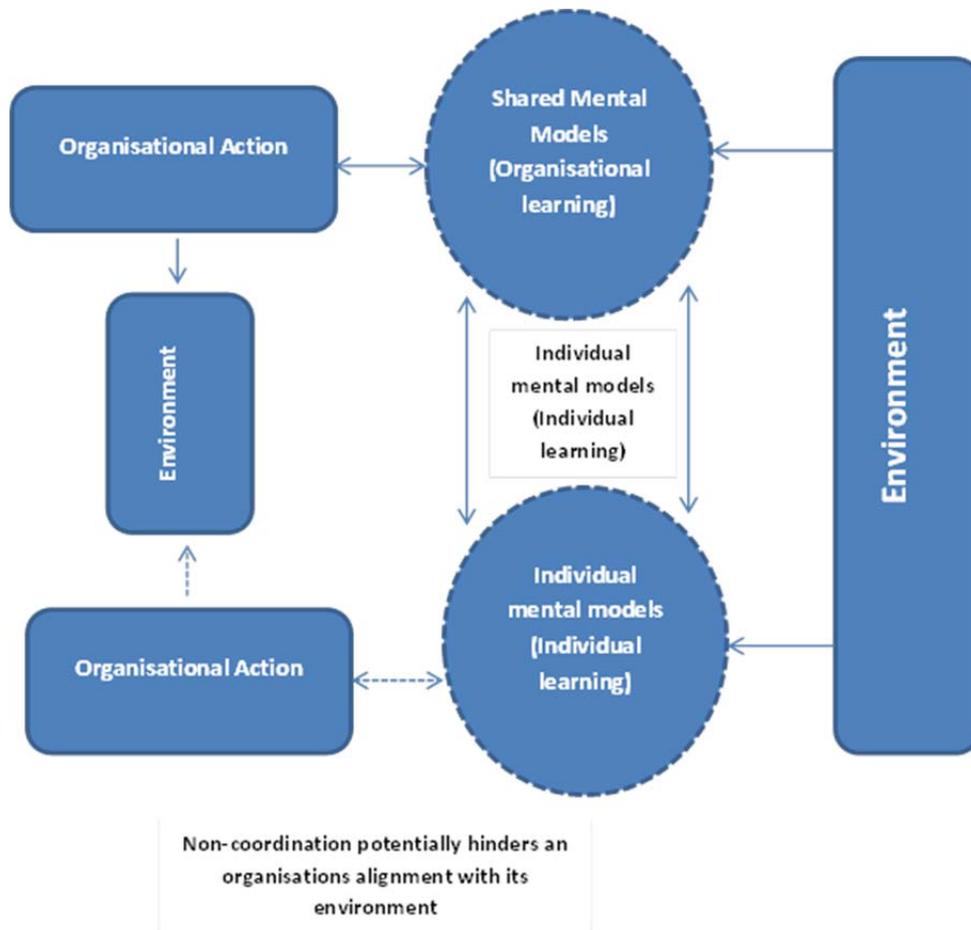


Figure 19: Model of the process of organisational learning.

Source: (Campbell & Armstrong 2013, p. 252).

Knowledge creation is an organisations' unique and unmatched advantage. The competitiveness of an organisation is the result of its employees specialised knowledge, new knowledge that is generated by the organisation, and the strategic actions made possible by innovation (Grant, 1996). The knowledge creation-innovation-learning spiral model is depicted in Figure 20.

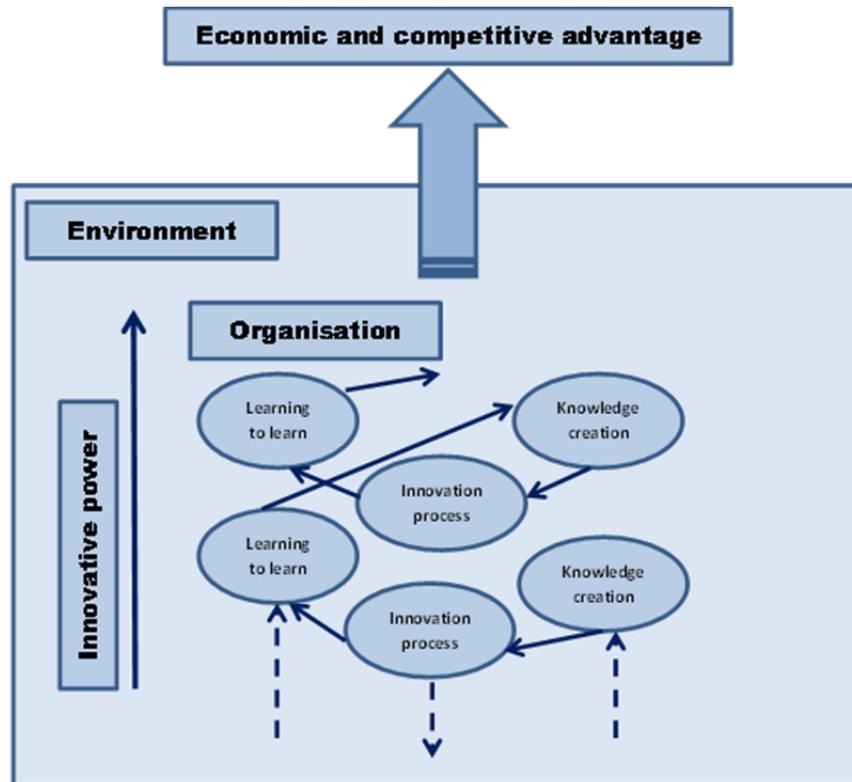


Figure 20: Knowledge creation-innovation-learning spiral model.

Source: (Merx-Chermin & Nijhof 2005, p. 140).

Knowledge exploration (related to tacit knowledge) and knowledge exploitation (related to explicit knowledge) are both relevant to innovation. Jointly, these processes take place in a context where meaning and significance are assigned to the created knowledge. Exploration is the pursuit of original knowledge by way of discovery and experimentation, outside the ambit of specialisation in the organisation. The accumulation of experience in specific specialisations as well as the growing proficiency gained by repetition leads to exploitation. Exploitation is the organisations' market knowledge, distinguishing the dissimilarity of new and existing market knowledge. Generic types of innovation is fashioned by the dimensions of market knowledge and the dimensions of knowledge creation. This classification is graphically shown in Table 48.

Table 48: Generic classification of innovation.

	Knowledge creation	
Market knowledge	Tacit knowledge Socialisation and externalisation Knowledge of the particular circumstances of place and time (Exploration – new knowledge)	Explicit knowledge Combination and internalisation (Exploitation – existing knowledge)
New market knowledge (commercialised)	<ul style="list-style-type: none"> • Architectural innovation • Radical innovation • Major product / service innovation • Radical innovation (revolutionary in nature) 	<ul style="list-style-type: none"> • Niche innovation • Modular innovation • Architectural innovation • Market breakthrough
Existing market knowledge	<ul style="list-style-type: none"> • Revolutionary innovation • Architectural innovation • Major process innovation • Technological breakthrough 	<ul style="list-style-type: none"> • Regular innovation • Incremental innovation (occurs more frequently) • Incremental product, service, process innovation

Source: (Popadiuk & Choo 2006, p. 310).

Knowledge creation deals with the generation and application of knowledge resulting in novel competencies. Innovation is also concerned with novel competencies but focusses on how it can be changed into processes, products or services carrying economic value. Market knowledge is of significant value to the innovation process as its ongoing interaction with technical knowledge defines an organisation's innovation capacity, leading to prosperity. Tension exists between scientific/technical knowledge and experience-based knowledge because of the way they are produced. Lundvall and Johnson (1994) developed a set of distinctions to understand the difference between the diverse means and ways through which different types of knowledge occurs (Jensen *et al.* 2007, p. 682). Types of knowledge and modes of innovation are linked to knowledge categories in Table 49.

Table 49: Forms of knowledge and modes of innovation.

Modes of learning & Innovation	Knowledge Categories	Knowledge types	Acquire knowledge in different ways and through different channels
Scientific and technical	Explicit (codified)	<ul style="list-style-type: none"> Know-what (Brown & Duguid, 1998) Know-why 	Learn through books, lectures, etc. Found in databases, memos, notes, documents, etc. (Botha <i>et al.</i> , 2008). Based on the production of codified scientific/technical knowledge. Fairly easy to identify, store, retrieve (Wellman,2009).
Experience-based	Tacit (Intuitive & hard to find) (Brown & Duguid, 1998)	<ul style="list-style-type: none"> Know-how Know-who 	Context dependent and personal. Rooted in practical experience, based on doing, using, interacting (Nonaka, 1994). Relational learning may contribute both to common codes of information and to social bonds of friendship.

Source: (Jensen *et al.* 2007, pp. 680-682).

Organisations need people to create knowledge and should therefore support creative individuals or afford them context to create knowledge. Knowledge created by individuals is intensified by knowledge innovation and manifests itself as part of the organisations' knowledge system . Knowledge understood as a production factor comprises values, personal beliefs, insights and experiences and is embodied in human capital, individual tacit and explicit knowledge, or entrenched in social capital, organisational processes and practices (Swart & Kinnie 2003). Knowledge, treated as an independent production factor, should be understood as the sum total of our understanding of society and nature (Tang 2005, p. 1). Knowledge, a strategic asset, needs to be purposefully managed (made productive) to enable the organisation to generate notable benefit from it. To capitalise on the knowledge vested in its employees, an organisation needs to energetically and purposefully create, capture, transfer and mobilise the knowledge in its employees and the organisations' relationships and routines to enable the organisation to become accustomed to a changing environment. The ever-increasing rate of global-scale change makes learning and adapting more critical to the survival of organisations, and having a culture of learning and adapting has become critical (Swart & Kinnie 2003).

An enabling context facilitates effective knowledge creation (Popadiuk & Choo 2006, p. 307). Knowledge, being dynamic, relational, and based on human action, is dependent on the people and the situation. Organisational knowledge assets are the product of

knowledge workers. Organisations draw on individuals' tacit knowledge (embedded cognitively as conceptual frameworks in the minds of individuals) as a source of innovation when they develop and implement explicit knowledge (tangible knowledge presented as hard data and codified procedures), as they cannot develop, learn or grow independently of their human capital. The conversion of tacit knowledge to explicit knowledge is a key process in creating new knowledge, and is elevated in the knowledge-innovation (or knowledge-creation) spiral (Fig 21, p. 142)(Lee & Yang 2000, pp. 788-789). The transfer between knowledge workers of tacit knowledge is a noteworthy contribution to organisations developing their innovation capacity (Cavusgil *et al.* 2003, p. 8). The greater the extent of tacit knowledge transfer, the greater the organisations' innovation capability becomes, and the greater the organisations' innovation capability, the higher its innovation performance will be (Cavusgil *et al.* 2003, p. 15).

The knowledge spiral explains the underlying tacit and explicit knowledge interrelationship amongst individuals and groups. Nonaka (Nonaka & Takeuchi 1995, p. 57) focused on the interaction between knowledge types through the processes of socialisation, externalisation, combination and internalisation (Thompson & Walsham 2004, p. 725). Local communication structures, cultural norms and understandings are put forward as elements of context. Knowing is a combination of organisationally and biographically embedded contextual elements, and demand a complex conception of context (Thompson & Walsham, 2004:726). Sense-making highlights the invention that paves the way for interpretation (Weick, 1995:14). The process is a spiral, suggesting that each circuit builds on the previous one (Nonaka & Takeuchi 1995, p. 56), is depicted in Figure 21.

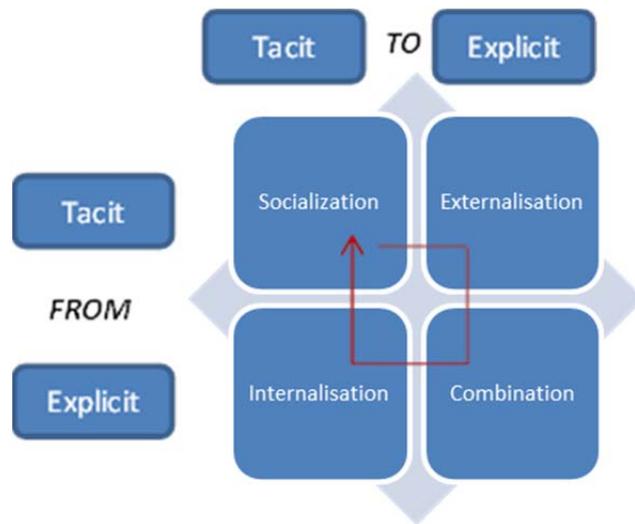


Figure 21: The “engine” of knowledge.

Source: (Nonaka & Takeuchi 1995, p. 57).

Given the difficulty of interpreting and transferring tacit knowledge between individuals and organisations, socialisation that supports inter-organisational relationships is a dominant factor in the transfer of tacit knowledge (Cavusgil *et al.* 2003, p. 15). Subsequently knowledge can be managed through people-based approaches such as discussions or connecting with experts in formal and informal activities, where shared knowledge donates a common basis for interpretation and communication (Zhou *et al.* 2007). Individuals keep their human capital, while contributing to the value of the organisation (Bogdanowicz & Bailey 2002, pp. 125-126).

Organisational management acknowledges the importance of supporting knowledge sharing to gain competitive advantage. Stimulating knowledge sharing amongst employees promotes innovation (Argote & Ingram, 2000). Organisational support theory holds that members of staff who perceive support from an organisation will reciprocate in ways valued by the same organisation. Organisations are dependent on new idea generation and the reuse of knowledge acquired in one situation and utilised in another, both facilitated by knowledge sharing (Walsh, Bhatt & Bartunek 2009; Wilson, Goodman & Cronin 2007).

Nonaka (1994) draws attention to two ways of knowledge creation: transferring knowledge and new knowledge creation. New knowledge creation is inseparable from knowledge conversion, learning and innovation (Alavi & Leidner 1999, pp. 22-24). The interaction amongst tacit and explicit knowledge points to four types of knowledge conversion, depicted in Table 50.

Table 50: Modes of knowledge conversion.

Conversion of tacit knowledge to new tacit knowledge through social interactions and shared experiences among organisational members	Socialisation: The social nature of knowledge creation is transferring existing tacit knowledge from one member to another. New knowledge per se may not be created, but only knowledge that is new to the recipient. Socialisation can result in new knowledge being created when an individual obtains a new insight triggered by interaction with another.
Conversion of tacit knowledge to new explicit knowledge (e.g., articulation of best practices or lessons learned).	Externalisation: This is about coding tacit knowledge, rather than creating new knowledge. Again, a weakness in viewing knowledge on a tacit-explicit continuum is that new explicit knowledge may have been created, but from existing tacit knowledge, so although transferability of knowledge is facilitated, no truly new organisational knowledge has been created.
Creation of new explicit knowledge by merging, categorising, reclassifying and synthesising existing explicit knowledge .	Combination: This mode, unless performed by technology such as data warehousing and data mining, is missing an intermediate step -- that of an individual drawing insight from explicit sources (i.e., internalisation) and then coding the new knowledge into an explicit form (externalisation). Combination is thus a redundant label unless it can be performed without human intervention.
Creation of new tacit knowledge from explicit knowledge (e.g., learning and understanding that results from reading or discussion).	Internalisation: This may be the simple conversion of existing explicit knowledge to an individual's knowledge. New knowledge is created when the explicit source triggers a new insight.

Source: (Alavi & Leidner 1999, pp. 22-24; Nonaka 1994).

The capacity to create new knowledge, problem-solving, and the capacity to assimilate existing knowledge, are similar, but what is learned may vary. There is no difference between the preconditions for learning and problem-solving, and subsequently for creative processes. Both learning and problem-solving are cumulative, meaning that prior possession of relevant knowledge and skills that enable creativity leads to associations and linkages that may not have been considered. Learning is cumulative, and acquiring new knowledge should be staggered. The extent of prior knowledge structures determine the aptitude to assimilate and exploit novel knowledge. In order for effective and creative utilisation of such novel knowledge to occur, the new and old knowledge should be exceptionally closely linked, to facilitate assimilation, while some

section of that knowledge needs to be reasonable distinct, but related. The cumulateness of the learning process implies that its expansion is domain-specific and path- or history-dependent.

Novel knowledge is the most valued commodity in the knowledge society, and organisations are dependent on the ability of individuals to change and grow themselves. The application of knowledge is the ability to put what one learns into practice, and this increases one’s competence (Haines Centre for Strategic Management 2005). Human learning can be defined as acquiring new knowledge or modifying existing knowledge, behaviours, skills, attitudes, and values or preferences. Bloom’s taxonomy of learning underpins these overlapping domains of cognitive (knowledge), affective (attitude) and psychomotor (skills) domains and the concept of developing competence, as knowledge workers, at the highest levels (Levels 5 and 6) (Bloom *et al.* 1956). Advances in and new understanding of cognitive science and pedagogical and learning research are included in Bloom’s revised taxonomy. These added levels of thinking skills overlap throughout the taxonomy, and are: remembering, understanding, applying, analysing, evaluating, and creating (Johnson *et al.* 2012, p. 240; Johnson *et al.* 2012, pp. 105-106).

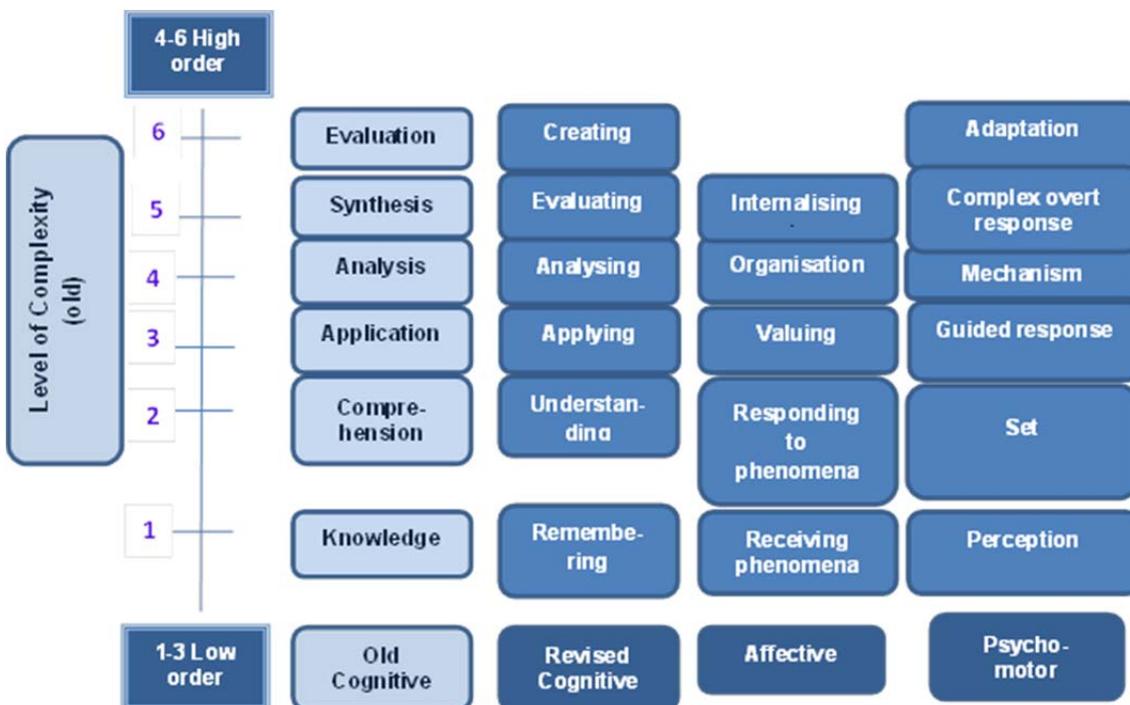


Figure 22: Details of Bloom’s Taxonomy of Learning Domains.

Source: (Odhabi 2007, p. 1127).

In defining the most valuable knowledge for the millennium citizen, views are widespread. The answer is formulated in terms of the knowledge and skills acquired in the mutually exclusive categories of education for cultural participation (political and moral) and economic productivity (cognitive skills such as flexibility, innovativeness, and adaptability) (Muller 2000, p 54). Generation X knowledge workers seek lifelong learning (to enhance their employability) above lifelong employment, and appreciate career independence (Elsdon & Iyer 1999). Knowledge workers respect involvement and challenge, while pursuing variety, stimulation, and constant change (Bogdanowicz & Bailey 2002, p. 128). To an organisation, substantive technical knowledge is critical, together with the mindfulness of where in the organisation serviceable harmonising expertise is present. The value assigned to knowledge may differ, depending on which stakeholder assigns the value. For example, the perceived value of knowledge differs between shareholders, management, and the individual employee (Bogdanowicz & Bailey 2002, p. 127).

3.6 KNOWLEDGE WORKERS AND THE KNOWLEDGE ECONOMY

Knowledge work is defined by the role of knowledge and human resources in an organisation in determining what will be made, how it will be made, and how it will be marketed, all in pursuit of a competitive advantage. The concept 'knowledge worker' refers to a person who, in the workplace, does knowledge work by principally engaging with information or developing and using knowledge. Knowledge workers are a valued commodity in a knowledge society, and their productivity is managed by observing productivity factors such as:

- defining the task at hand;
- making individuals responsible for managing themselves;
- making innovation an integral part of their work;
- continuous learning and teaching;
- productivity, including both quantity and quality of output; and
- knowledge workers being perceived and treated as 'assets' rather than as 'costs'.

Those employees referred to as 'knowledge workers' should not only be literate, but should possess competencies, knowledge, and skills related to the organisation, and

should be able to make scientific discoveries and inventions, and eventually engage in the process of innovation. Their value lies in their ability to use knowledge to act and communicate within a specific subject area. Through focused analysis, design, and/or development, they advance the overall understanding of a subject. By way of research, they define and solve problems using their expertise and insight, in an effort to influence company decisions, priorities, and strategies. In order to benchmark countries, the Knowledge Index (KI), devised by the World Bank Institute, gauges a country's ability to adopt and diffuse knowledge. In a broader framework the Knowledge Economy Index (KEI) considers whether the environment in a country is favourably orientated towards economic development through the effective use of knowledge. As progress is usually gradual (World Bank Institute 2007), strategies need to be altered to suit a country's level of development and its financial ability, as it would be financially unsustainable to invest in all the indicators. Both the KEI and the KI for the top 10 countries are presented in Table 51.

Table 51: Comparison between countries.

<u>Rank</u>	<u>Country</u>	<u>KEI</u> 0=weakest 10=strongest	<u>KI</u>	<u>Innovation</u>	<u>Education</u>	<u>ICT</u>
1	Denmark	9.52	9.49	9.49	9.78	9.21
2	Sweden	9.51	9.57	9.76	9.29	9.66
3	Finland	9.37	9.39	9.67	9.77	8.73
4	Netherlands	9.35	9.39	9.45	9.21	9.52
5	Norway	9.31	9.25	9.06	9.60	9.10
6	Canada	9.17	9.08	9.44	9.26	8.54
7	United Kingdom	9.10	9.06	9.24	8.49	9.45
8	Ireland	9.05	8.98	9.08	9.14	8.71
9	United States	9.02	9.02	9.47	8.74	8.83
10	Switzerland	9.01	9.09	9.90	7.68	9.68
<hr/>						
65	South Africa	5.38	5.33	6.85	4.68	4.45
81	China	4.47	4.66	5.44	4.20	4.33
85	Namibia	4.28	3.37	3.14	2.65	4.34
109	India	3.09	2.95	4.15	2.21	2.49

Source: (World Bank 2011).

The World Bank Institute considers the following dimensions to evaluate the emergence of a knowledge economy in different countries: economic inducement and the institutional regime, human resource education and skills, a modern and adequate information and communication infrastructure and an effective innovation system that is significant according to the KEI (World Bank 2011; Sundac & Krmpotic 2011, p. 107).

It is important to distinguish between divergent and convergent thinking, as they relate to diverse sets of activities, and may require opposite circumstances (Gong *et al.* 2013, p. 447). Creative idea generation is grounded in divergent thinking, that involves an extensive search for information and the creation of several different answers to problems. Idea implementation is based on convergent thinking, the ability to restrict all possible alternatives to a single solution (Bledow *et al.*, in Gong *et al.* 2013, p. 447). Empirical evidence suggests that both these activities generate superior organisational performance (HE & Wong, in Gong *et al.* 2013, p. 447). Knowledge work has shifted towards tasks that require expert knowledge and advanced communication skills (Bridge 2006, p. 37). Knowledge workers produce new capability by creating or modifying strategy, and analyse data to establish relationships and connections, while identifying trends. They are capable of understanding cause and effect in their analysis. Knowledge work ranges from the endeavour of individual specialists, through technical activity, professional projects and management programmes, to organisational strategy, knowledge markets, and global-scale networking.

Acquiring such knowledge demands complex cognitive processes, including perspicacity, learning, determining relationships, analysis, and communication. Tapscott (2006) identified the sustainable competence that is sought in a 21st century knowledge worker as collaboration driven by the Internet and social media tools. The competence to structure expert networks through peer-to-peer knowledge sharing across organisational boundaries and public (government) and private (commercial) associations, to solve problems by exchanging knowledge that has commercial value is also sought. The knowledge society is remarkable as a result of the daily quantity of knowledge and information it produces, as well as the use of ICT in data-intensive processes.

The concept knowledge economy, introduced and researched by Drucker since 1969, refers to how knowledge, the most important production factor and the most critical engine of economic growth (Tang 2005, p. 1), can be used as a generator of economic benefit, which implies that knowledge has marginalised capital and labour as production factors. Knowledge has superseded traditional production, and has become the prominent competitive corporate resource (Havens & Knapp 1999). This fact was further

emphasised by Bell, who observed that, between 1909 and 1949 (Bell 1973, p. 12), non-agricultural sector skills contributed more towards economic growth than labour and capital did. Powell and Snellman (2004, p. 201) describe the knowledge economy as 'production and services based on knowledge-intensive activities that contribute to an accelerated pace of technological and scientific advance as well as equally rapid obsolescence.' This underscores Audretsch (2007) argument that the knowledge economy is profoundly dependent on intellectual capital. The knowledge economy manifests in:

- prodigious intensification in the volume of knowledge;
- an acceleration in the swift global flow of knowledge;
- substantial growth in knowledge-mediated industries and services;
- amendments to the access to and 'control over' knowledge; and
- deliberation on the relationship between knowledge and innovation.

(Jiang 2008, p. 347).

The intellectual capital of an organisation captures the sum of all knowledge resources within or outside of the organisation that it utilises to attain a competitive advantage (Kim *et al.* 2006, p. 32). Intellectual capital can be categorised into three components: human capital, which includes the individuals knowledge, skills and capabilities; organisational capital, that comprises institutionalised knowledge as well as organised experience that have been residing in databases, manuals, culture, systems, structures and processes; and social capital, that comprise the knowledge entrenched in relationship networks as well as interactions between individuals (Hsu & Sabherwal 2012, p. 492).

Key dimensions for a knowledge-based economy include education, employment, and a skilled workforce; knowledge generation and accumulation, and knowledge networks; frameworks for innovation and innovation outputs; changing composition of industrial investment, trade and industry value added; and the degree of internationalisation and position in the global arena of the economy (Strategy to Increase R&D Investment in SA 2011, p. 7). The recombination of the market economic dynamics, the dynamics of knowledge-based innovation, and governance creates a systems perspective. Figure 23 expands on this concept generated from the recombination of the economic dynamics of

the market. The concept highlights the fact that a range of factors play a role in a knowledge-based economy, and that the interpretation is dependent on the segment and issues to be addressed by the country, guided by a conceptual operationalisation that defines its application to different sectors, in addition to its influence on people at national and individual levels. The Knowledge Society is explained in Figure 23.

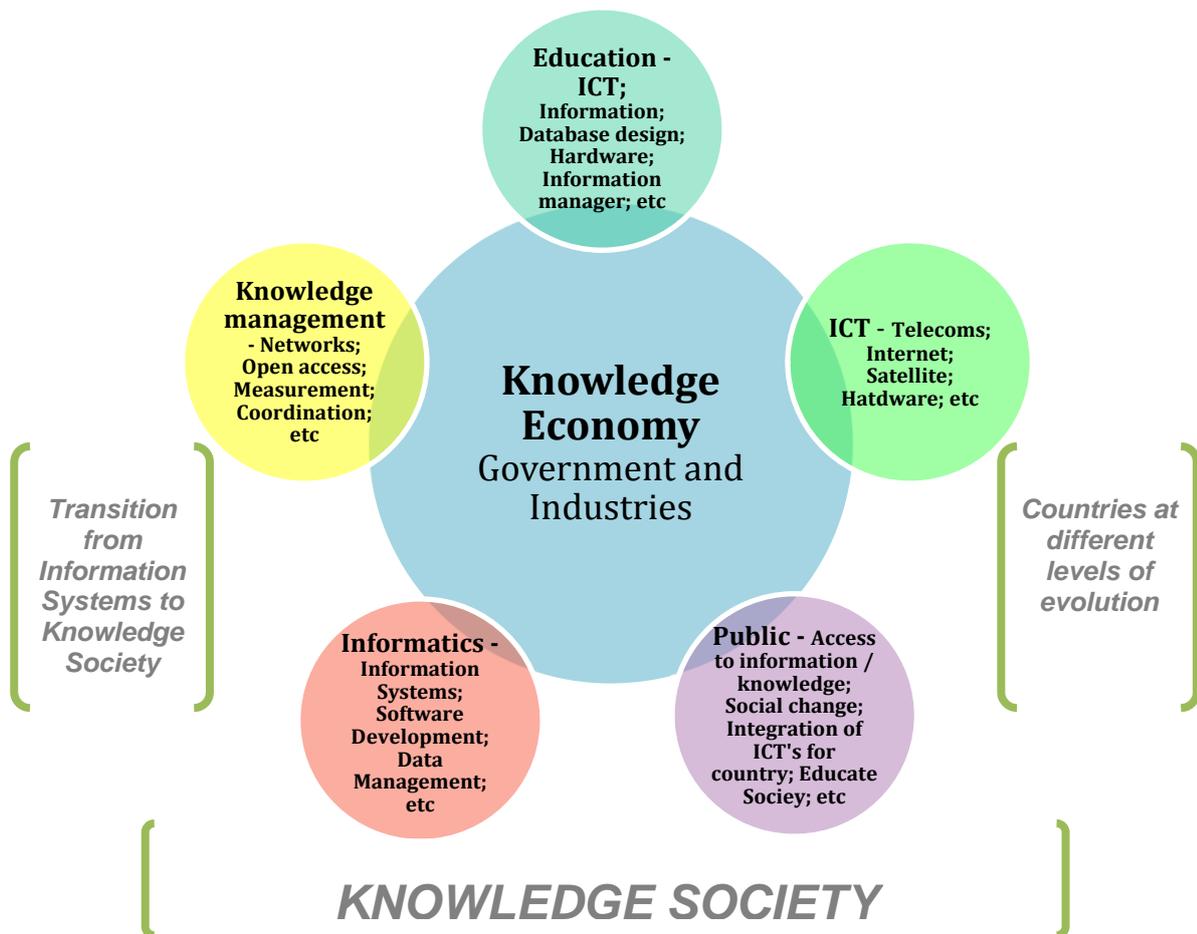


Figure 23: A model of a Knowledge Society.

Source: (Mbananga 2007, slide 16).

Some essentials of a knowledge-driven economy are:

- innovation being a permanent feature;
- an economy of networks at different hierarchical levels;
- networks embodying new forms of organisations;

- human capital playing an important role as a result of its capacity to learn, which is more important than the level of knowledge;
- codified and distributed tacit knowledge; and
- proliferation of information-related activities, evident in all sectors of the economy.

For a country to be part of the knowledge economy, it needs to recognise the importance of the four pillars of a knowledge society (Britz *et al.* 2006, p. 28). These pillars are summarised in Table 52.

Table 52: The 4 pillars of a knowledge society.

ICT's and connectivity	Usable content	Infrastructure and deliverability	Human intellectual capability
<ul style="list-style-type: none"> • Backbone of knowledge society, well-developed, well-maintained and affordable information infrastructure to allow access to and manipulation of dematerialised economy. • Technology is the levelling player in the knowledge society 	<ul style="list-style-type: none"> • Affordable • Available • Timely • Relevant • Readily assimilated • In language users can understand 	<ul style="list-style-type: none"> • Dematerialised economy without physical infrastructure is of little use and can even create unmet expectations 	<ul style="list-style-type: none"> • Central element in the society is knowledge and technology is merely the facilitator in development • Need to create & utilise knowledge
Four pillars of knowledge society			

Source: (Compiled from Britz *et al.* 2006, pp. 27-29).

Most advanced economies are fundamentally knowledge-based (Cooke & Leydesdorff 2003, p. 5), as economic growth is explained, not by traditional economic factors, but by productivity and competitiveness as a function of knowledge generation and information processing. The investment in human capital, including through education, is an essential component of the techno-economic paradigm. Economies recognise the technical and economic perspective that has influenced the way in which knowledge is generated, manipulated and utilised without time and space impediments. The change from the economics of things to the economics of information is typified by information that can uncouple from its original physical messengers allowing customised information to reach more people at the same time in an interactive way. This signifies that, at

basically zero cost, information can be integrated, altered, copied, customised, and even destroyed (Britz *et al.* 2006, pp. 27-28).

The concepts knowledge and knowledge management are related. Organisations may well be under-utilising knowledge as an innovative resource if they lack successful management of information and knowledge as they steer innovation in addition to the integration of knowledge (Baddi 2003; Chen *et al.* 2004).

3.7 KNOWLEDGE MANAGEMENT

Countries cannot only emphasize the investment in ICT as the infrastructure of the knowledge economy. There should also be organisational transformation encouraging the creation, use and sharing of knowledge. The knowledge economy is distinguished by the following characteristics, determining the socio-economic positions of industry and organisations:

- diffusion and sharing of knowledge and multiple networks leading to greater collaborations;
- gathering and the utilisation of information and knowledge, creating opportunities for organisational learning;
- and the development of a strategic know how.

(Mbananga 2007, slides 3-4).

An element of knowing is the value of a profuse organisational context in the generation of meaning (Von Krogh *et al.* 2011). Knowledge management, crucial for organisational development, is about managing information and consists of knowledge creation, interpretation, dissemination, use, retention, and refinement (Aggestam 2006, p. 295). Knowledge management can also include the subset of competitive advantage and customer satisfaction, organisational performance and innovation (Meihami and Meihami 2014, p. 90). Knowledge management relates to the modifications in the collective know-how of an organisation and how it acts. There can be knowledge losses, both desirable and undesirable as knowledge goes through different changes during the process (Aggestam 2006, p. 296). Figure 24 gives a knowledge management framework.

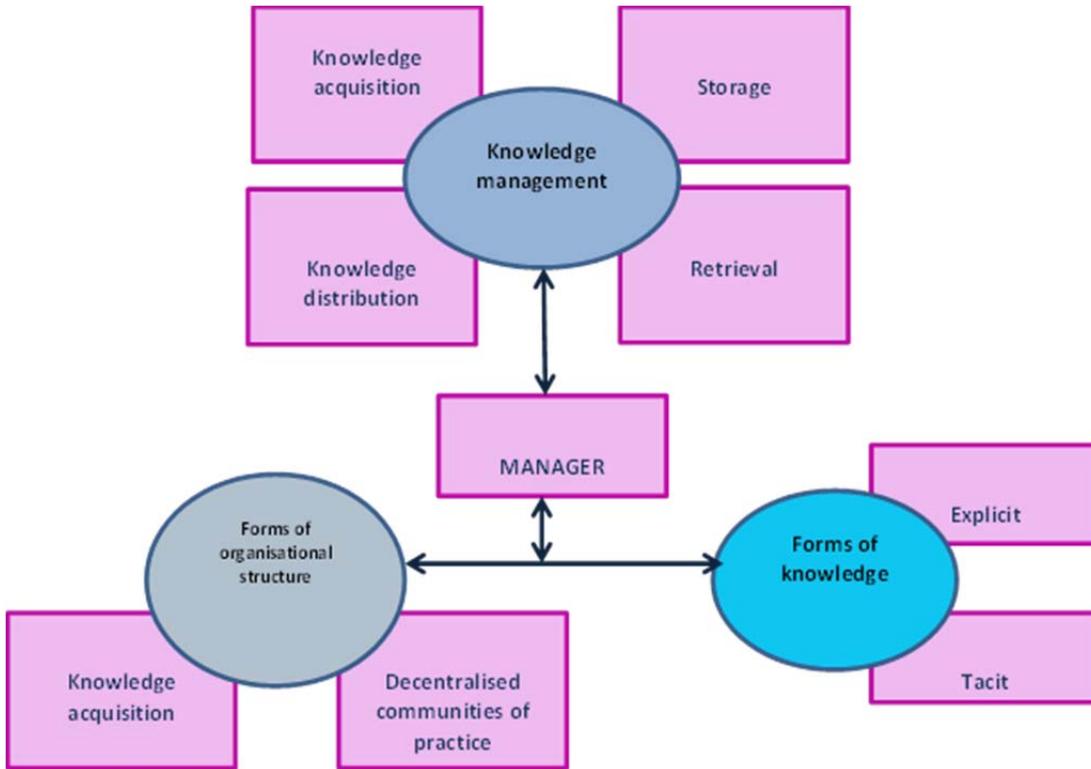


Figure 24: Knowledge management framework.

Source: (Chatterjee 2014, p. 5).

The major activities in knowledge management are: knowledge creation (Gold, Malhotra & Segars 2001), knowledge storage (Zack 1999), knowledge transfer, and knowledge application (Lin & Lee 2005), while the most significant factors leading to successful knowledge management are factors such as strategy and organisational culture, followed by IT support (Aggestam 2006, p. 297). The process of knowledge management is graphically depicted in Figure 25.

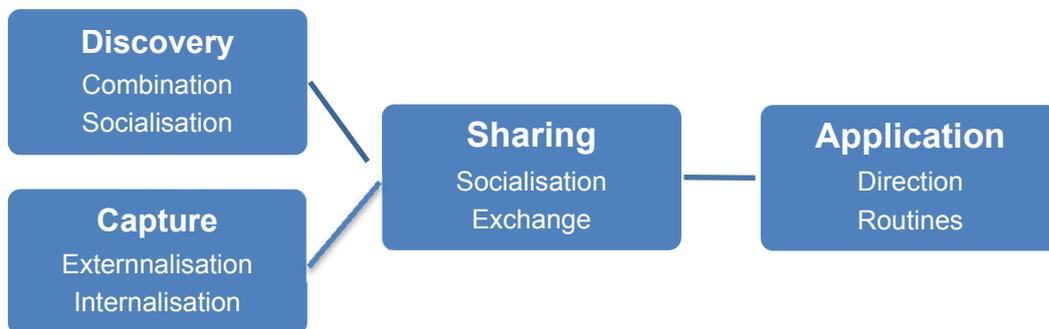


Figure 25: The process of knowledge management.

Source: (Meihami and Meihami 2014, p. 82).

Knowledge management capacity is critical for competitiveness (Bernard & Tichkiewitch 2008) and encompasses the all-inclusive knowledge acquisition and utilisation process, in an attempt to rationalise and manage the vast amounts of formal and informal knowledge that any organisation possesses (Simone, Ackerman & Wulf 2012, p. 109). The process runs from locating or identifying and capturing knowledge (including tacit knowledge), through to enabling and leveraging such knowledge within the organisation (Takeuchi & Nonaka 2004). Knowledge management exemplifies a collection of organisational procedures that procures knowledge, assimilate it internally, and then transmit and exploit it in the organisation. These procedures all influence the organisation’s absorptive capacity (Zhou, Tan & Uhlener 2007, p. 11). A knowledge management framework is given in Figure 26.

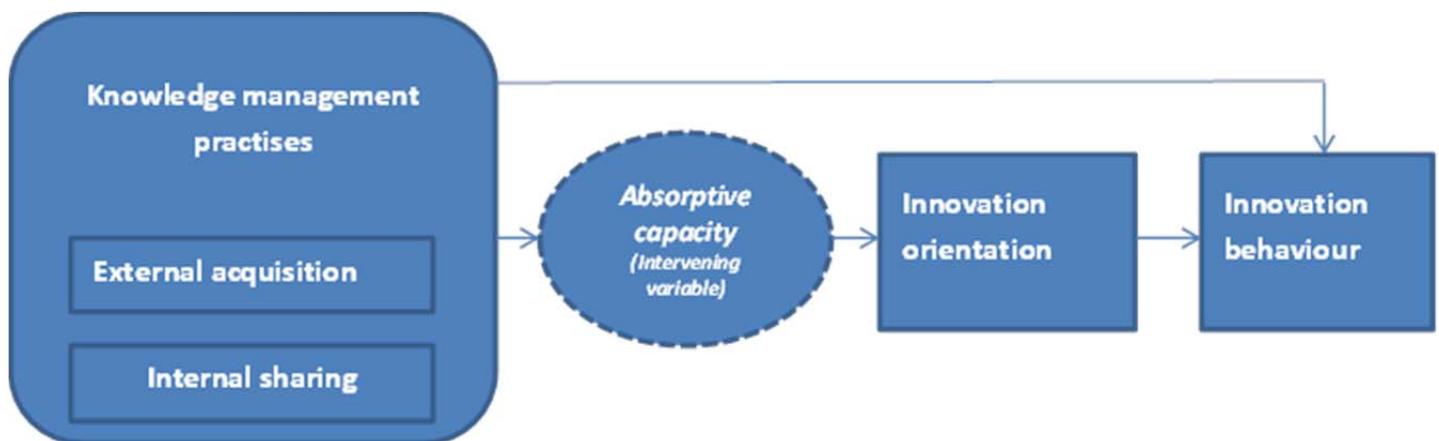


Figure 26: Knowledge management framework.

Source: (Zhou, Tan & Uhlener 2007, p. 33).

The creation of novel knowledge and ideas comes from innovation in knowledge management. Such creation of novel business outcomes is designed to improve the internal business procedures and constructs. Knowledge management creates market-driven products and services and according to Du Plessis (2007:27–28), it provides a knowledge-driven culture by facilitating the conversion of tacit knowledge into explicit knowledge and assimilating it through the organisation. Knowledge management assist in building competencies required for the innovation process by providing context to the organisations body of knowledge (Du Plessis, 2007:27–28).

Knowledge management and organisational learning are critical for adopting a strategy to compete globally (Zou & Cavusgil 2002). It is imperative to recognise the systemic relationship amongst innovation and knowledge management and the value it can add towards sustainable competitive advantage (Du Plessis 2007, p. 28). Innovation in the management of knowledge leads to the creation of novel knowledge and ideas that is designed to improve the internal business procedures and constructs. Knowledge management creates market-driven products and services and according to Du Plessis (2007, pp. 27-28), it provides a knowledge-driven culture by facilitating the conversion of tacit knowledge into explicit knowledge and assimilating it through the organisation. Knowledge management assist in building competencies required for the innovation process by providing context to the organisations body of knowledge (Du Plessis 2007, pp. 27-28). The notion of absorptive capacity offers the theoretical basis for why knowledge management contributes to innovative behaviour (Zhou, Tan & Uhlener 2007, p. 1). The process of knowledge management and competitive strategy is displayed in Figure 27.

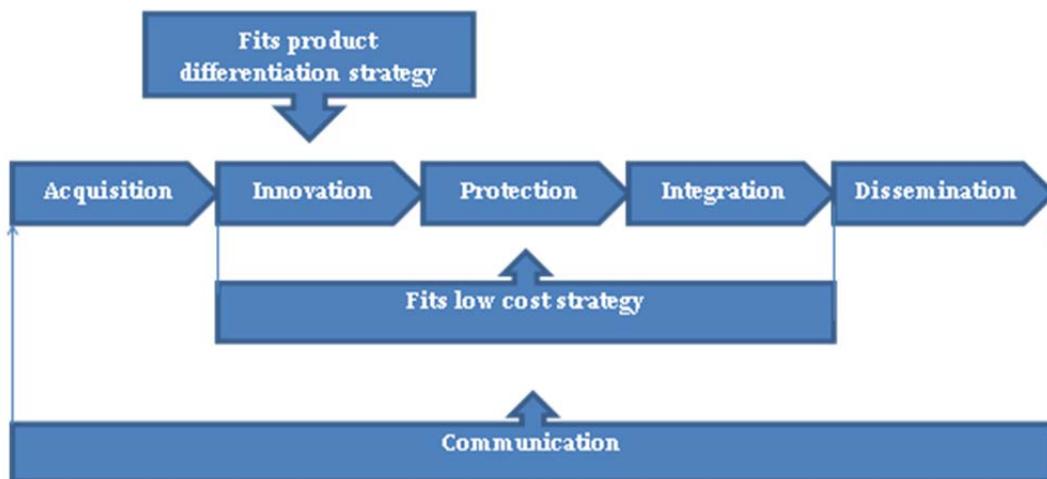


Figure 27: The process of knowledge management and competitive strategy.
Source: (Lee and Yang 2000, p. 792).

To conceptualise the relationship between knowledge management (focussing on the content) and organisational learning (focussing on the process) is to view organisational learning as the goal of knowledge management. Knowledge management assists

organisations to embed knowledge into organisational processes, in order to unremittingly improve its practices and behaviours to realise its goals. In this sense, organisational learning is a way for an organisation to improve its utilisation of knowledge, leading to improved organisational performance. Utilisation happens by individual as well as collective learning, leading to shared problem-solving and developing various interpretations to innovate. By embedding knowledge it can be re-used. (King 2009, pp. 3-7).

The concept, learning organisation, refers to an organisation that excels at organisational learning. The learning organisation focusses on the organisation as an entity (Aggestam 2006, p. 295). Knowledge management (a process) and the learning organisation (an entity) are dependent on each other and one cannot survive without the other. Therefore their different properties, goals, and relationships, is depicted in the following table, to enable a better understanding:

Table 53: A comparative analysis between a learning organisation and knowledge management.

	Learning organisation	Knowledge management
Culture Leadership / Management	learning culture, fostered by leadership	carried out by individuals; culture constraints the efficient use and managed within a culture
Vision	shared vision	must have a vision
Work processes	integrates attention to every aspect of knowledge	must be integrated
Organisational Learning	excels at organisational learning, a collective cognitive process	the result of organisational learning
External factors	meet these demands	
Internal factors	meet these demands	constraints the efficient use e.g. culture and IT
Systems thinking	how a learning organisation thinks about the world	
Organisational memory		e.g. data repository
Technical		prerequisite

Source: (Aggestam 2006, p. 297).

Four factors explicitly only appear in one domain, meaning that a learning organisation and knowledge management are on different levels of abstraction with different focusses and purposes (Aggestam 2006, p. 298).

Managing knowledge in a learning organisation has developed into an integral aspect of an organisational culture that thrives on innovation, data mining, and R&D. The practice of knowledge management is associated with managerial thinking, employee behaviour and decision-making under organisational settings. Managing the knowledge resource in an organisation allows managers to oversee how generated knowledge is utilised, shared, stored, and retrieved (Chatterjee 2014, p. 2). It is important to remove constraints and organisational obstacles to knowledge management. Both the bureaucratic and hierarchical organisational forms and the situated and tacit character of knowledge, make it difficult to extract and transfer knowledge (Chatterjee 2014, p. 2). Organisational structures should be grounded on principles that facilitate the growth of knowledge, enable transfer of knowledge, and increase the flow of information.

The impact of knowledge management can be measured by:

- learning curve: it accelerates time to competence;
- experience curve: increases sharing of experience;
- strategic alignment: decreases capability gap;
- connectivity: increases search cycle efficiency;
- risk management: increases confidence in work outputs;
- value management: improves stakeholders perception of the value of the organisation; and
- psychological contract: improves staff morale and productivity.

(Massingham & Massingham 2013, pp. 246-247).

3.8 KNOWLEDGE ABSORPTION

Absorbing knowledge is seldom automatic. In order to interpret messages about the world, you need to have some prior knowledge about it. Prior skills and competences are needed to implement and manage change about the world. This infers that alone

standing codified knowledge is not economically beneficial. Knowledge absorption is a relational process of learning from experience (Cohen & Levinthal 1990) and applying such knowledge in the context of an organisation. The ability to increase organisational knowledge resides within individuals, and is reliant on research and development financing as well as collecting data from marketing. Organisations who gain an understanding from their current operations also increase organisational knowledge; its investment in research and development; its ability to gain insights from current operations; and its ability to collect information from marketing efforts (Cohen & Levinthal 1990, p. 128).

This understanding can be extended to include the organisations ability to externally collect and process knowledge and to expand and supervise associations that lead to knowledge absorption. The basis for identifying, obtaining and applying new knowledge is delivered by prior related knowledge.. According to Cohen *et al.* internal ability and external acquisition are complementary (Cohen & Levinthal 1989; 1990). As absorptive capacity is cumulative, the existence of certain levels of knowledge provides better indicators to predict and import new technological opportunities, which increase organisations' collaboration opportunities (Ahuja 2000) and, ultimately, increase innovative performance. Internal capability and external collaboration in knowledge absorption is given in Table 54.

Table 54: Internal capability and external collaboration in knowledge absorption.

Knowledge	Internal capability	External collaboration
Developed how:	<p>Highly educated employees increase knowledge stock through daily tasks (Mangematin & Nesta, 1999). Organisation needs to invest in internal research and development to develop its absorptive capacity (Lenox & King, 2004:331). Organisational setting within which employees work is important to increase absorptive capacity, e.g.:</p> <ul style="list-style-type: none"> - cross-function interfaces - rotating R&D personnel through other units - restructuring of employment relations in the form of Human Resource Management practices 	<p>Highly educated employees contribute to know-how trading by facilitating access to external networks of knowledge utilising scientific knowledge (Rothwell & Dodgson, 1991). They can recognise and value new external knowledge. Organisation needs to create linkages to external knowledge sources e.g. universities (Lenox & King: 2004:331). Cohen and Levinthal (1994) recognise importance of the strength of external relationships in the development of absorptive capacity. Such relationships may create and strengthen information channels and thicken the knowledge flow, increasing the efficiency of the transfer of tacit knowledge.</p>
Developed through:	<p>Information provision - the impact of information provision is contingent on the extent to which potential adopters can access information from previous adopters and past experiences at their local subunit. The ability of managers to provide information and the ability of individuals within the organisation to assimilate that information is contingent on experience with related practices. (Lenox & King, 2004:331–343).</p>	

Source: (Vinding 2006, p. 508).

As illustrated in Table 58, absorptive capacity depends on the organisational structure, broad knowledge in terms of formal education (Romijn & Albaladejo 2002), organisation-specific knowledge in terms of work experience (Rosenberg 1982; Senker 1995), and lastly the development of a closer relationship with external actors. The broadening of the notion gives acceptability to the significance of human capital (Vinding 2006, p. 508) Organisational Human Resource management practices, blended with the growth in affiliation with vertically associated players and knowledge institutions, encourage the capability to innovate and reduce the degree of innovative imitations, showing an enhanced capacity to tackle complexity. Policy and managerial imperatives therefore are:

- to extend the user-producer interaction as well as incorporating knowledge establishments;
- supporting human resource enhancement through the development of organisational structure, culture as well as methods, that encourage a qualified workforce, by utilising expressions such as decentralised responsibility and empowering employees in the organisation.

(Vinding 2000).

Organisation-specific aspects that facilitate knowledge transfer include the nature and distribution of expertise within the organisation, the configuration of communication with the external milieu, the organisation and sub-units of the organisation (transfer of knowledge across and within sub-units). Von Hippel (2005, p. 134) showed the significance of intimate relationships with purchasers and suppliers, for innovation, that leverage individual absorptive capacity and strengthen organisational absorptive capacity. The conceptual definition of knowledge-sharing refers to “the use of knowledge databases, best practises conferences, technology, cross-functional teams, emails and social network software etc. to share self-constructed knowledge with colleagues. Through deep conversations and brainstorming from this sharing process, one’s knowledge will become more inclusive and complete; while the synergistic effect of the accumulation of organisational knowledge assets will be developed during knowledge transfer and sharing”. (Chiu & Chien, 2015, p. 99). The importance of collaboration is demonstrated in Table 55, depicting a theoretical review of categories of literature on collaboration (Vinding 2000, p. 1).

Table 55: Theoretical review of categories on collaboration literature.

LITERATURE:			
Strategic Management	Industrial Organisation	Transaction Cost Economics	Innovation Theory
THEORIES:			
<p>Deal with the organisation and its internal organisation of activities:</p> <p>a. Competitive forces (Porter, 1980, 1985; Harrigan, 1988) based on structure-conduct-performance approach. Collaboration is viewed as a vehicle for shaping competition by increasing the competitive advantage of the organisation. Technological collaboration is seen as means to react on market needs and increase speed of introduction of new technology to market.</p> <p>b. Strategic networks can increase the efficiency via scale and economies of scope and reduce the transaction cost. Can establish synergies by exploiting different competencies (Miles & Snow, 1984). Gain power by gaining market position and controlling information.</p> <p>c. Resource-based view: competitive advantage is sustained due to rare, unique resources of the organisation which are difficult to substitute. Collaboration is necessary.</p> <p>d. Dynamic capability approach: Accumulate and deploy new skills and capabilities to comply with rapidly changing environment. Collaboration is a way of acquiring skills of another organisation.</p> <p>e. Strategic option to new technologies: resources needed to operate in uncertain market environments. Collaboration is seen as a way of giving organisations chance to react to new opportunities</p> <p>f. Knowledge-based view (Grant, 1996, 2000; Kogut & Zander, 1992; Conner & Prahalad, 1996). Key role of the organisation is to create, store and apply knowledge. Collaboration matches organisation's product domain with its knowledge domain in order to get the right match.</p>	<p>Focus on the organisation and the effects of its actions on industrial structure, economic efficiency and social welfare:</p> <p>g. Failure in market of scientific and technological knowledge – R&D collaboration leads to higher R&D investment, better diffusion of results, elimination of wasteful duplication of efforts and access to new markets.</p>	<p>Mixture between strategic management and industrial organisation:</p> <p>h. Transaction cost economics: explain why organisations organise internally while addressing market/industry forces. Main argument is the relative cost (production dependent on knowledge base of organisation) and transaction cost of carrying out transaction under different organisational regimes – market, hierarchy or mixed. Collaboration reduces transaction cost and opportunistic behaviour.</p>	<p>Chain-linked model (Kline & Rosenberg, 1986):</p> <p>i. Technological change loop between knowledge-producing and knowledge using agents. Coordination of innovation requires network of collaboration partners with different competencies (Lundvall, 1985, 1992).</p> <p>j. Systemic approach: includes concepts of national innovation system and learning economy. Crucial elements of organisations' competitiveness are the ability to continuously participate in learning processes and to develop and absorb new knowledge.</p> <p>k. Networked learning economy – with opportunity and capability to access and join knowledge determines success of individuals and organisations.</p>

Source: (Vinding 2000, p. 1).

Absorptive capability is a crucial resource for organisations that is difficult to imitate by competitors. It requires learning capability and builds problem-solving skills, empowering

organisations to learn from or receive external knowledge. This concept is explored in more detail below.

3.9 ABSORPTIVE CAPACITY

Innovation is a precondition for economic growth and development. Economic development requires absorptive capacity. Absorptive capacity refers to the ability to identify the value of novel entities and to absorb, adapt and apply them. This ability to combine new ideas in internal processes is dependant on knowledge resources and the primary knowledge level as well as the ability of the organisation to consider external knowledge (Gholizadeh *et al.* 2015, p. 113). Consistent advances in absorbing knowledge are a prerequisite for an organisations' successful exploitation of external knowledge, and result from a sustained, path-dependent internal process of accumulating knowledge (Mowery, Oxley & Silverman 1996). Higher levels of absorptive capacity are positively related to an organisations' ability to exploit sources of technical knowledge outside its peripheries. According to Tsai (2001), organisations should have an appreciation for new knowledge, and be able to exploit such knowledge from other organisations to support their own innovative behaviours.

The concept of absorptive capacity describes the capacity to identify, assimilate, and exploit external knowledge. This external knowledge influences an organisations' strategy and performance (Ben-Oz & Greve 2012, p. 1), and ranges from the individual level to the entire nation (Jansen *et al.* 2003; Narula 2004) which can be intertwined. Absorptive capacity is associated with specific domains of knowledge, rather than being an organisation-wide capability (Savory 2006, p. 1052). Establishing and sustaining competitive advantage depends upon effectively developing internal knowledge, utilising external knowledge, and exploiting knowledge to generate innovations (Kogut & Zander 1992; Teece 2010). Absorptive capacity is crucial for an organisations' innovation behaviour, even though the operationalisation of it is still ambiguous (Lane *et al.* 2006; Zahra & George 2002).

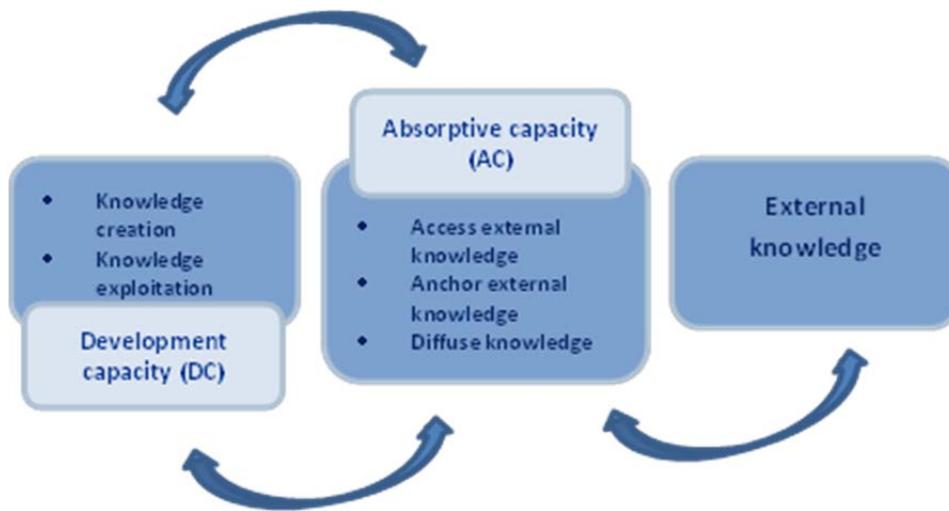


Figure 28: Developing internal knowledge through absorptive capacity.

Source: (Zahra & George 2002).

For an organisation to be innovative, the absorptive capacity on multiple levels in the organisation needs to be developed through the organisations' ability to access external knowledge and transform and implement such knowledge within the organisation, to enhance its key competencies. Individuals contribute significantly to absorptive capacity of organisations. Such absorptive capacity is measured by training and education as well as by determining the level of research and development that increases the organisations' knowledge-sharing and absorptive capacity (Daghfous 2004, p. 25). Organisations are able to manage and develop absorptive capacity through the implementation of procedures that stimulate the transfer of knowledge and make available an organisational structure for improving the flexibility and effectiveness of knowledge transfer.

A crucial element of innovative capability is the ability to make the most of absorptive capacity, and greatly depends on prior knowledge (Liao, Fei & Chen, 2006) that presents a capability to recognize the value of new information, assimilate and apply it to commercial ends. Cumulativeness and its influence on the development of expectations infers that its development is domain specific as well as path- or history reliant.

Liao *et al.* (2006) argued that an organisation's absorptive capacity is also dependent on the accessibility of foreign technology, the organisation's learning ability, and incentives to implement new technologies.

Taking into consideration the resources and capabilities in an organisation, the best learning styles as well as innovation performance under different contingencies, has been determined by Chien *et al.* and is graphically displayed in Figure 29 (Chien *et al.* 2015).

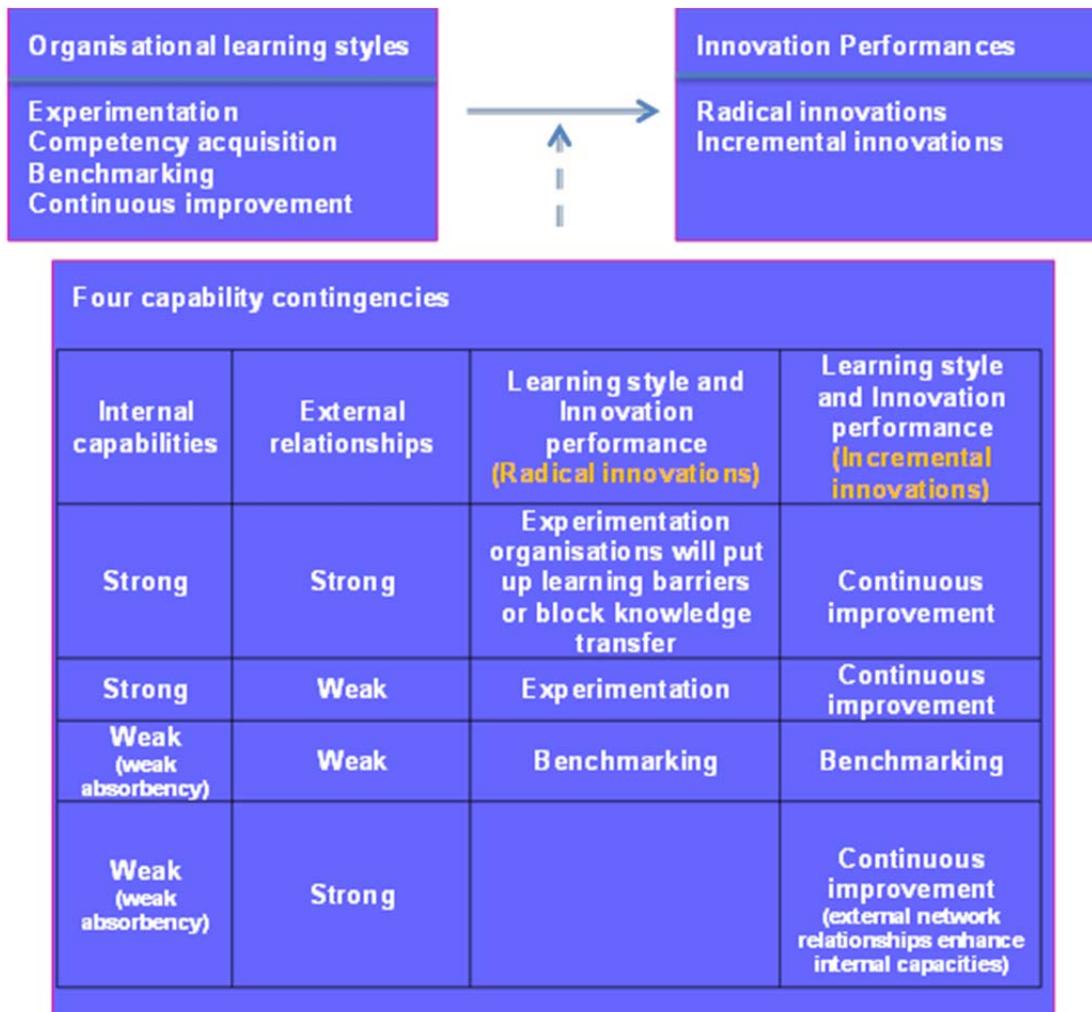


Figure 29: Capability contingent: the impact of organisational learning styles on innovation performance.

Source: (Chien *et al.* 2015, pp. 25).

Absorptive capacity is thus the capacity to identify, assimilate, and exploit external knowledge that influences an organisation’s strategy and performance, and, as a result can be utilised as a context to scrutinise the influence of long- and short-term goals on organisational actions. Organisations learn from performance feedback. Absorptive capacity is capable of serving as a knowledge construction mechanism external to the

technology domain. Managers evaluate organisational performance in relation to an aspiration level. In the wake of low performance, answers are sought for and changes are made until an encouraging answer to the performance problem is found. Low performance intensifies organisations' attempts to obtain new knowledge that increases absorptive capacity (Ben-Oz & Greve 2012, pp. 1-10), as is explained in Table 56.

Table 56: Using absorptive capacity to test performance feedback theory.

	Potential absorptive capacity: <ul style="list-style-type: none"> Knowledge acquisition capabilities Knowledge assimilation capabilities (feeds knowledge) 	Realised absorptive capacity: <ul style="list-style-type: none"> Transformation capabilities Exploitation capabilities (exploits knowledge)	Environmental contingency effect <ul style="list-style-type: none"> Dynamism – degree of instability of environment; the rate of change; the level of turbulence increases effect of performance below aspiration level on potential absorptive capacity and decreases effect on realised absorptive capacity (others: Heterogeneity and Munificence)
Long-term performance	Performance below aspiration level – organisation invests in developing capabilities with the intention to exploit it to improve performance – gaining strategic flexibility. Produces capabilities that are commercialised through realised absorptive capacity		
Short-term performance		Gain product and process innovation	
Commercialisation process – first potential absorptive capacity, then realised absorptive capacity			

Source: (Zahra & George, in Ben-Oz & Greve 2012, p. 2).

Engaging in knowledge management creates and develops absorptive capacity, resulting in better innovation behaviour, even though there is no theoretical relationship between the two (Zhou, Tan & Uhlener 2007, p. 11). An organisations' absorptive capacity ability is dependent on the appropriateness of its knowledge management practices. These behaviours need to be controlled on an organisational level in order to guarantee optimal results, as individual abilities are insufficient. Other related concepts are receptivity, (to identify and take advantage of technology) and innovative procedures that give explanation to a collection of competencies that an organisation can confidently perform,

while reflecting its focus on the organisations' innovation efforts (Zahra & George 2002). Other determining factors of absorptive capacity are:

- research and development activities;
- associated prior knowledge and abilities of persons;
- the structure of the organisation and human resource management practices.

(Schmidt 2005, p. 1).

Knowledge-based competition has magnified the importance of learning alliances as a fast and effective way to develop competitive capabilities. A key challenge to organisations is to successfully manage their internal operations and supply chains, and gather sufficient relevant knowledge before they consider investing in process change (Carillo & Gaimon 2000). A study by Tortoriello (2015) revealed that persons capacity to convert external knowledge into innovation, depended on their position in the internal knowledge-sharing network of the organisation (Tortoriello 2015, p. 587). He showed that the positive effects of external knowledge on innovation are increased by the presence of structural holes in the internal knowledge-sharing network and conversely the positive effects of external knowledge on innovation are reduced by the absence of structural holes in the internal knowledge-sharing network (Tortoriello 2015, p. 587). Tortoriello (2015) also reasoned that a brokering position in the organisational knowledge-sharing network, favors a persons ability to leverage external knowledge towards the generation of innovation. Residing in a brokering position increases the prospect of successfully translating external knowledge owing to:

- the larger number of opportunities for creative knowledge recombination it delivers;
- the bigger ease of knowledge sharing and acquisition being promoted; and
- the wider access to internal talent and capabilities.

(Tortoriello 2015, p. 588).

Absorptive capacity is what enables organisations to effectively acquire and utilise such external and internal knowledge. Absorptive capacity affects the organisations' ability to innovate and adapt to its changing environment, enabling competitiveness. Absorptive capacity is a learning capability and a problem-solving skill that enables an organisation to assimilate knowledge (Kim 1998). It is not one-dimensional, but consists of various

skills and dimensions (Lane & Lubatkin 1998; Cohen & Levinthal 1990; Jansen *et al.* 2003). The integration of internal and external learning is given in Figure 30.

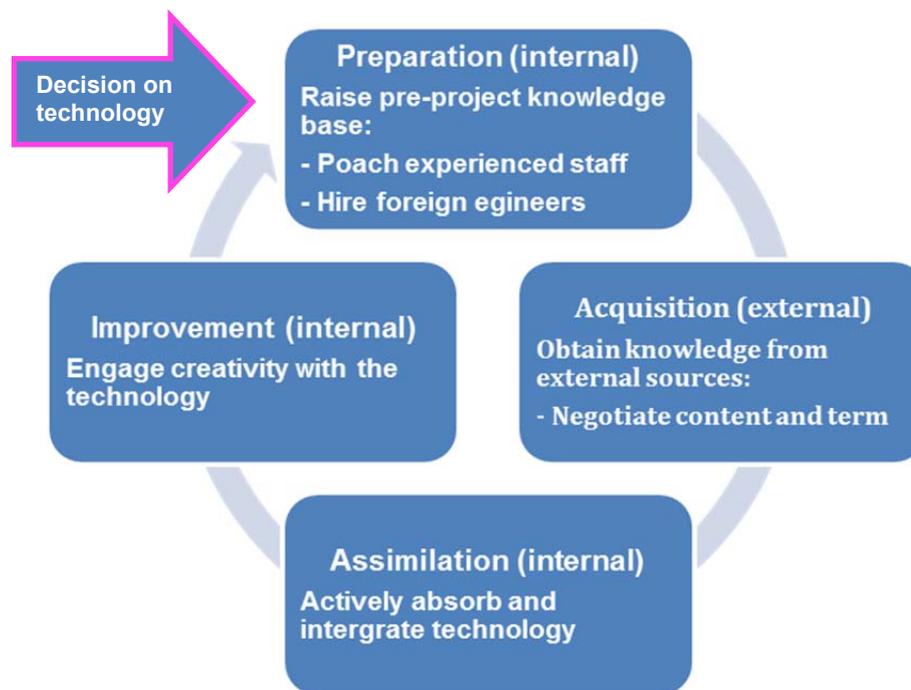


Figure 30: Integrating internal and external learning.

Source: (Bell & Figueiredo 2012, p. 27).

Cohen and Levinthal (1990) identified three components of an ‘ability-based’ concept of absorptive capacity: recognition or identification of the value of external knowledge, assimilation and application of knowledge for commercial ends. Zahra and George (2002) added a fourth component to the ability-based concept of absorptive capacity: transformation or exploitation. This aspect of ability-based absorptive capacity can be supplemented by other analyses along the dimensions of efficiency. Efficiency is defined as the cost and economies of scale associated with a certain level of identification, assimilation, and exploitation of external knowledge, scope, and flexibility (Jansen *et al.* 2003).

Zahra and George (2002) contrasted the concepts of potential absorptive capacity (conceptualised as knowledge management) and realised absorptive capacity. Zahra

and George refer to the organisational routines and processes that may enhance the organisations' ability to assimilate knowledge, leading to potential absorptive capacity, whereas the actual ability itself refers to realised absorptive capacity. Potential absorptive capacity (dependent on the availability of relevant knowledge and the sources and type of co-operation partner the organisation has access to) makes an organisation receptive to:

- knowledge acquisition (identifying and acquiring); and
 - assimilation capability (analysing, processing, interpreting, and understanding);
- whereas realised absorptive capacity (dependent on the degree of appropriateness of relevant technology) is a function of:
- transformational capability (developing and refining); and
 - exploitation capability (applying for benefit).

Absorptive capacity as a complex organisational construct, and is graphically illustrated by Smith, in Figure 31.

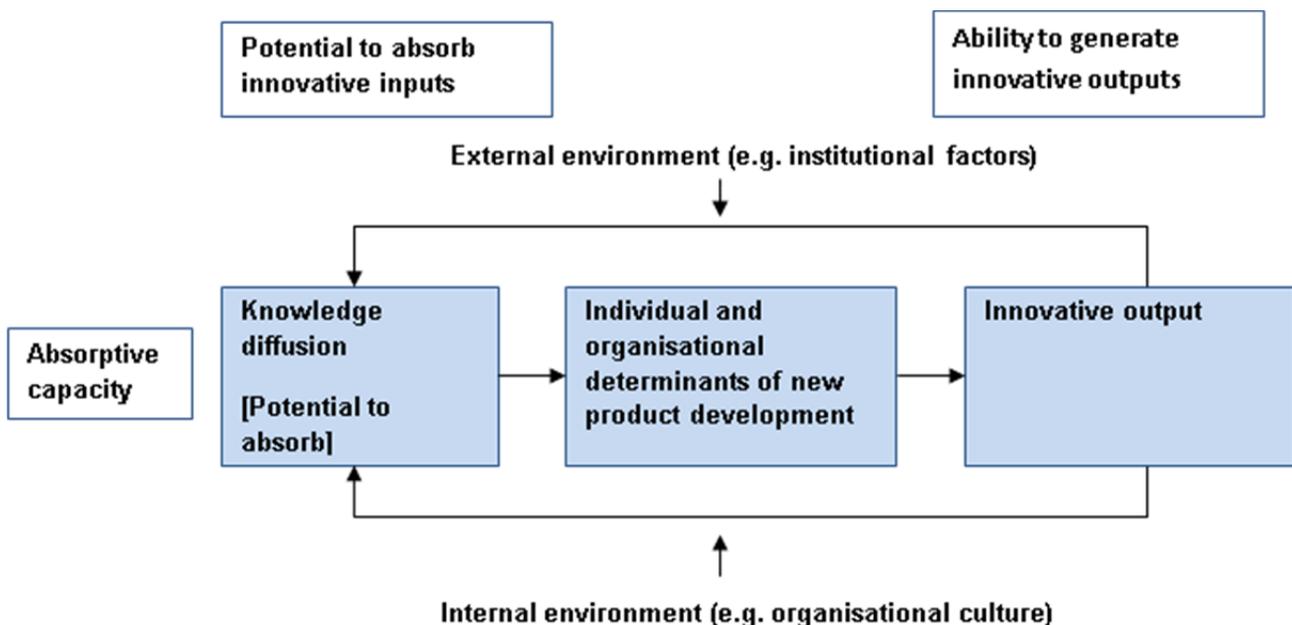


Figure 31: Absorptive capacity.

Source: (Smith 2006, p. 78).

Schmidt (2005, p. 1) distinguishes between three types of absorptive capacity:

- intra-industry: using knowledge from an organisations' own industry (exploitation uses informal networks instead of formal channels);
- inter-industry: using knowledge from other industries; and
- scientific knowledge: using knowledge from research institutions (exploitation requires less broad distribution, but depends on translation of this knowledge before it is disseminated through workshops and/or seminars.)

The differences between these types of absorptive capacity — intra-industry, inter-industry, and scientific absorptive capacity — are conspicuous. Diverse types of knowledge are associated with each of these different types. Higher absorptive capacity is needed for scientific knowledge than for other types of knowledge.

Absorptive capacity is not one-dimensional, and comprises several skills and dimensions (Schmidt 2005, p. 3). Different kinds of knowledge (from one's own organisation, from other industries, and scientific knowledge) are associated with different absorptive capacities. Higher absorptive capacity increases the capacity to use fundamental rather than applied knowledge. Specific kinds of knowledge need different mechanisms to be transferred. Schmidt concluded (2005) that organisations can build and manage absorptive capacity through procedures that stimulate knowledge transfer and by tendering an organisational structure providing flexibility as well as efficiency of knowledge transfer, within employees. Not all types of mechanisms to transfer knowledge are equally suited for the exploitation of specific kinds of knowledge (Schmidt 2005, p. 3), as is illustrated in Table 57.

Table 57: Absorptive capacity determinants.

Determinants of different types of absorptive capacity (they act as complements rather than substitutes)		
R&D activities (determine exploitive absorptive capacity in the long run)	Human Resource and Knowledge Management	Organisation of knowledge
Build absorptive capacity and transfer of knowledge. Build knowledge stock by generating new knowledge and innovation. Gatekeeper act as boundary spanner or interface between organisations and environment. (Gradwell, 2003; Cohen & Levinthal, 1990).	Absorptive capacity is path dependant (related to prior knowledge) and is cumulative, and is, as such, linked to the educational level of employees (Schmidt, 2005:5). Gatekeeper act as boundary spanner or interface between organisations and environment. (Gradwell, 2003; Cohen & Levinthal, 1990).	Absorptive capacity is not the sum of its employees' abilities. Determines exploitative absorptive capacity and transfer of knowledge. Organisational structures leading to cross-functional communication and tacit knowledge sharing lead to enhanced absorptive capacity. Close networks and relationships (Gradwell, 2003; Daghfous, 2004). Absorptive capacity is determined by the ability to stimulate and organise knowledge sharing. HR management can stimulate learning through rewards and training (Mahnke et al, 2005; Daghfous, 2004). Management and organisational structures distort information transfer (Lenox & King, 2004; Gao <i>et al.</i> , 2008:395).

Source: (Schmidt 2005, p. 3).

With regard to learning-set theory, developing absorptive capacity requires intense effort. Organisational absorptive capacity does not equal the sum of individuals' absorptive capacity, but is dependant on connections across an assortment of individual competences. It also depends on transfers of knowledge across and within sub-units which necessitates an understanding of the organisations structure of communication as well as the character and distribution of expertise within the organisation. An organisation therefore should not only be able to collect and understand information, but also have the ability to manipulate it (Absorptive Capacity: A New Perspective on Learning and Innovation, http://media.vteducation.org/labos/Innovation_labovTE/Absorption.pdf, p. 5)

When knowledge structures are highly differentiated, the requisite level of background may be rather high. Shared knowledge is essential for communication. Innovation is the result of diverse knowledge structures coexisting in the same mind. The sum of the Interaction between individuals with diverse and different knowledge structures, with sufficient levels of knowledge overlap ensuring effective communication, will augment the

organisations' capacity for innovation – beyond what any individual can attain. Critical knowledge is substantive technical knowledge plus the mindfulness of useful complementary expertise outside of the organisation (Absorptive Capacity: A New Perspective on Learning and Innovation, http://media.vteducation.org/labos/Innovation_labovTE/Absorption.pdf, pp.3 – 4.). A summary from literature on absorptive capacity is given in Table 58.

Table 58: Absorptive capacity summary.

<p>Absorptive capacity Knowledge-based competition has magnified the importance of learning alliances as a fast and effective way to develop such capabilities. A key challenge to organisations is successful managing of internal operations and supply chains. Organisations should not invest in process change until they have sufficient relevant knowledge (Carillo and Gaimon (2000). Absorptive capacity is what enables organisations to effectively acquire and utilize external as well as internal knowledge which affects the organisation's ability to innovate and adapt to its changing environment and be competitive. Defined as:</p> <ul style="list-style-type: none"> • set of organisational routines and processes by which organisations acquire, assimilate, transform and exploit knowledge to produce a dynamic organisational capability (Zahra & George, 2002) • capacity to learn and solve problems (Kim, 1997) • the organisation's ability to identify, assimilate and exploit outside knowledge (Cohen & Levinthal, 1990) <p>Acquired:</p> <ul style="list-style-type: none"> • organisation's ability to access external knowledge • organisation's ability to transform and implement external knowledge within the company to enhance core competencies <p>Measured:</p> <ol style="list-style-type: none"> 1. ascertain the level of R&D – increases organisation's knowledge-sharing and absorptive capacity 2. training and education <p>Elements:</p> <ol style="list-style-type: none"> 3. acquisition – ability to recognise, value and acquire external knowledge that is critical to organisation's operations 4. assimilation– ability to absorb external knowledge 5. transformation– ability to develop routines that facilitate combining existing knowledge with newly acquired and assimilated knowledge 6. exploitation– ability to apply new external knowledge commercially to achieve organisational objectives <p>Factors affecting it:</p> <ul style="list-style-type: none"> • external <ul style="list-style-type: none"> ○ external knowledge environments (open system) + relationship with players in networks ○ organisation's position in knowledge network (cross-leveiling). External determinant is the strength of relationship with other members of the knowledge networks – may include knowledge institutions as primary participants (e.g. academic institutions) • internal 			
Internal Factors	Effect on absorptive capacity	Factors of absorptive capacity affected	References
Prior knowledge base	Positive relation	Acquisition	Cohen & Levinthal, 1990 Nomaka & Takeuchi, 1995: Ahanotu, 1998
Individuals absorptive capacity	Positive relation	All factors	Cohen & Levinthal, 1990

Levels of education and academic degree Gives rise to creativity through new associations between old and new knowledge	Positive relation	Acquisition / assimilation / transformation	Vinding, 2000; Rothwell and Dodgson, 1991
Diversity of background Redundancy of information needed for communication (Davenport and Prusak; 1998). Knowledge should intersect (Grant 1996)	Positive relation	Acquisition / transformation	Cohen & Levinthal, 1990
Presence of gatekeepers (specialised actor's – reduce communication gap and mismatch in “cognitive orientation”)	Positive relation	Acquisition	Jones & Craven, 2001
Investment in R&D (bi-directional)	Positive relation	Acquisition	Veuglers, 1997; Vinding, 2000
Organisational structure (movement of knowledge)	N/A	Acquisition / transformation /exploitation	Wenaka Isch, Liao and Stoica, 2001; Boer, Bosch and Volberda, 1990;Nonaka and Takeuchi, 1995
Level of internal communication (enhances social integration mechanisms – capability contingent structure should be flat, flexible, adaptable, dynamic, participative)	Positive relation	Assimilation / transformation	Cohen & Levinthal, 1990 Boer, Bosch and Volberda, 1999
Level of organisational bureaucracy	Negative relation	Exploitation	Nonaka and Takeuchi, 1995
Organisational culture (promote one that is open to change) – empowerment of employees (distribution of power – power through authority – makes employees unable to adopt complex learning + creation of new ideas + new mental models)	Positive relation	Transformation	Lloyd, 1998
Size	Positive relation / negative relation	Acquisition / exploitation	Welsch, Liao and Stoica, 2001
Organisational inertia (opposite is organisational responsiveness)	Negative relation	Exploitation	Davenport and Prusak, 1998; Welsch, Liao and Stoica, 2001
HRM (recruitment, job rotation, reward system – knowledge sharing as criteria in performance	N/A	All factors	Simons, 1994; Davenport and Prusak, 1998; Veuglers, 1997

Source: Own compilation from literature review.

An organisations' ability to learn is central to the theory of absorptive capacity; it is influenced by its exposure to external knowledge, the presence of prior related knowledge (which influences assimilation of innovation) and its diversity of experience (Cohen & Levinthal 1990). Absorptive capacity is a sophisticated theory, because it emphasises both the external and internal factors and synthesises different threads in analysing innovation. Factors affecting the absorptive capacity of organisations — to effectively capitalise on external knowledge by recognising it and then assimilating and applying it internally, so that it leads to positive commercial ends — are elaborated on in Table 59.

Table 59: Internal and external factors affecting absorptive capacity.

External Factors			
<ul style="list-style-type: none"> external knowledge environments (open system) and relationship with players in networks; organisations' position in knowledge network (cross-levelling). External determinant is the strength of relationship with other members of the knowledge networks – may include knowledge institutions as primary participants (e.g. academic institutions). 			
Internal Factors	Effect on absorptive capacity	Factors of absorptive capacity affected	References
Prior knowledge base: Confers the ability to recognise the value of new information, assimilate (integrate, adapt, espouse, blend, embrace) it, apply it to commercial ends).	Positive relation	Acquisition	Cohen & Levinthal, 1990 Nomaka & Takeuchi, 1995; Ahanotu, 1998
Individual's absorptive capacity	Positive relation	All factors	Cohen & Levinthal, 1990
Levels of education and academic degree Gives rise to creativity through new associations between old and new knowledge	Positive relation	Acquisition / assimilation / transformation	Vinding, 2000; Rothwell & Dodgson, 1991
Diversity of background Redundancy of information needed for communication (Davenport & Prusak; 1998). Knowledge should intersect (Grant, 1996). Learning is more difficult in novel domains – diverse background provides more robust basis for learning because it increases the prospect that incoming information will relate to what is already known.	Positive relation	Acquisition / transformation	Cohen & Levinthal, 1990
Presence of gatekeepers (specialised actors – reduce communication gap and mismatch in “cognitive orientation”).	Positive relation	Acquisition	Jones & Craven, 2001 Vinding, 2000
Investment in R&D (bi-directional)	Positive relation	Acquisition	Veuglers, 1997; Vinding, 2000

Organisational structure (movement of knowledge)	N/A	Acquisition / transformation / exploitation	Wenaka, Isch, Liao & Stoica, 2001; Boer, Bosch & Volberda, 1990; Nonaka & Takeuchi, 1995
Level of internal communication (enhances social integration mechanisms – structure should be flat, flexible, adaptable, dynamic, participative).	Positive relation	Assimilation / transformation	Cohen & Levinthal, 1990 Boer, Bosch & Volberda, 1999
Level of organisational bureaucracy.	Negative relation	Exploitation	Nonaka and Takeuchi, 1995
Organisational culture (promote one that is open to change) – empowerment of employees (distribution of power – power through authority – makes employees unable to adopt complex learning + creation of new ideas + new mental models).	Positive relation	Transformation	Lloyd, 1998
Size	Positive relation / negative relation	Acquisition / exploitation	Welsch, Liao & Stoica, 2001
Organisational inertia (opposite is organisational responsiveness).	Negative relation	Exploitation	Davenport & Prusak, 1998; Welsch, Liao & Stoica, 2001
HRM (recruitment, job rotation, reward system – knowledge sharing as criteria in performance evaluation)	N/A	All factors	Simons, 1994; Davenport an& Prusak, 1998; Veuglers, 1997

Source (Adapted from Daghfous 2004, p. 23).

An organisation with a knowledge orientation exhibits competence in knowledge management. Du Plessis describes knowledge management as a guiding business philosophy, influencing strategies embarked on by management (Du Plessis 2007, p. 22). Viewing, innovation in a broader perspective as a system-based, organisation-wide orientation toward innovation, needs an understanding of the outcomes of the orientation, both positive and negative (Simpson, Siguwaw & Enz 2006). Such an innovative attitude that converts society's needs into opportunities for business and creates and delivers new customer value, is explored in the next section.

3.10 INNOVATION ORIENTATION

Organisational innovativeness is an organisations' overall innovative capability by pioneering novel products in the market, or unlocking new markets, through the combination of strategic orientation and innovative behaviour and processes (Wang & Ahmed 2004). Innovation is associated with creativity and change (Drucker 1991; Hellriegel *et al.* 1998; Robbins & Coulter 1996), or is deemed as something new, leading

to change (West & Farr 1990). This gives the impression that the standard for innovativeness is multi-dimensional and grounded in products and/or services, processes, behavioural (cultural) and infrastructure characteristics. Market orientation is known as an organisational culture that favours behaviours dictating how employees should think and act, as it relates to the realisation of the marketing concept (Day 1990; Kohli & Jaworski 1990).

The key capabilities of a market orientation include:

- market sensing;
- customer linking and service;
- competitor sensing;
- technology development;
- new product and/or service development; and
- organisational communication.

The precursors of an innovation culture are comparable to those of a market-oriented culture (O'Cass & Ngo 2007) which is foundational in supporting innovation (Marinova, 2004). The organisations' cultural attention needs to recognise the need for innovation. Cultural openness (Van de Ven, in Thompson and Purdy 2009) is evidenced by the connection between market orientation and innovation (Zaltman *et al.* 1973). A study by Hult *et al.* confirmed innovativeness as an important antecedent of business performance (Hult *et al.* 2004). The prevailing conclusion is that a market-oriented culture seems to underlie organisational innovativeness (Hult *et al.* 2004).

Innovation includes: conception, suggestion of an idea, adoption and implementation of the innovation. Systemic learning capabilities may be a critical success factor for organisations with important knowledge acquisition and implementation (Calisir *et al.* 2013, p. 176). Learning orientation is the presence of values that affect the degree to which an organisation questions its theories in use, its mental models and its dominant logic (Li & Lin 2008). Learning orientation is how organisations comprise aspects, such as:

- managerial commitments and risk taking combined with experimentation;
- open-mindedness and a shared vision;

- dialogue and participative decision making combined with inter-organisational knowledge sharing;
- creative thinking;
- team improvement, and
- interaction with the external environment.

(Calisir *et al.* 2013, p. 176). Learning orientation is depicted in Figure 32.

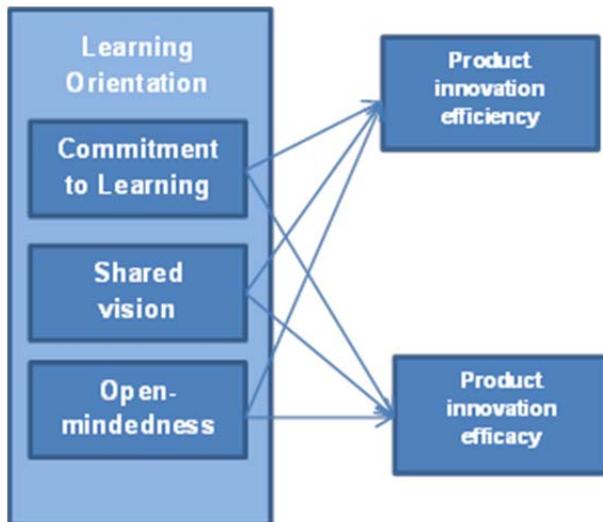


Figure 32: Learning orientation.

Source: (Calisir *et al.* 2013, p. 179).

Innovation refers to a knowledge process intended to create new knowledge towards the development of viable commercial solutions (Herkema 2003). The process encompasses technical, physical and knowledge-based actions central to the development of product development routines (Cardinal *et al.* 2001). Innovation embodies the process by which new outcomes come into being (Gloet *et al.* 2012). To create long-term survival or a competitive advantage through innovation, the organisation needs to support a collective set of understandings and beliefs, extensively accepted at all levels and functions throughout the organisation, facilitating continual processes to ensure long-term competitive advantage.

Organisations need to design an all-embracing innovation orientation permitting the recognition of market dynamism while providing a systemic organisational multi-

dimensional knowledge structure to develop an organisations' dynamic capabilities through strategies and innovation. Linking external markets and an organisations dynamic capabilities is an innovation orientation directing an organisation towards reinforcing and transforming its knowledge to build innovation. The long-term success of an organisation relies more on an overall organisation-level innovation orientation, producing capabilities that generate innovations and less on specific innovations (Siguaw, Simpson & Enz 2006, pp. 556-559). The components contributing towards the definition of innovation orientation is tabled in Table 60.

Table 60: Components contributing towards the definition of innovation orientation.

Components of definition	Researchers
<p>Innovation orientation is a learning philosophy in which organisations have common standards and beliefs about learning and knowledge that pervade and guide all functional areas towards innovation.</p>	<ul style="list-style-type: none"> • Worren, Moore & Cardona (2002) – promote idea of common mission and innovation climate of new ideas; • Hurlety & Hult (1998) – open-to-new-ideas corporate culture of innovation orientation; • Atuahene-Gima & Ko (2001) – environment that allows employees to keep up with changing technologies; • Simpson, Siguaw & Enz (2006) – shared beliefs and understandings.
<p>Innovation orientation is strategic. Innovation orientation is considered an intentional and calculated plan or strategic intent.</p>	<ul style="list-style-type: none"> • Amabile (1997), Manu (1992), Worren, Moore & Gardona (2002) – innovation orientation is strategic; • Worren, Moore & Gardona (2002) – provides direction towards organisation-wide commitment to more and faster innovations; • Amabile (1997), Worren, Moore & Gardona (2002) – encompass total enterprise and all functional areas of the organization; • Simpson, Siguaw & Enz (2006) – expansive view of continuously growing and morphing to keep abreast of competitors and markets.
<p>An organisation thinks as one collective body and sees the organisation succeed.</p>	<ul style="list-style-type: none"> • Amabile (1997), Worren, Moore & Gardona (2002) – Innovation orientation trans-functional acclimation is seen as a set of common understandings and beliefs pervading the innovation-orientated organisation that creates a unifying comradeship, enthusiasm and devotion among employees.

Source: (Siguaw *et al.* 2006, pp. 556-559).

Innovation orientation is thus defined as:

a multi-dimensional knowledge structure composed of a learning philosophy, strategic direction and trans-functional beliefs that, in turn, guide and direct all organisational strategies and actions, including those embedded in the formal and informal systems, behavior, competencies, and processes of the organisation to promote innovative thinking and facilitate successful development, evolution and execution of innovations (Siguaw *et al.* 2006, p. 570).

An innovation-oriented knowledge structure can be described as a collection of organisation-wide common understandings that lead 'all organisational strategies and

actions, including those embedded in the formal and informal systems, behaviours, competencies, and processes of the organisation' and consequently drive the continuous innovation ability of the organisation (Garcia & Calantone 2002; Sigauw *et al.* 2006). The drivers, actions and outcomes of innovation orientation is given in Figure 33.

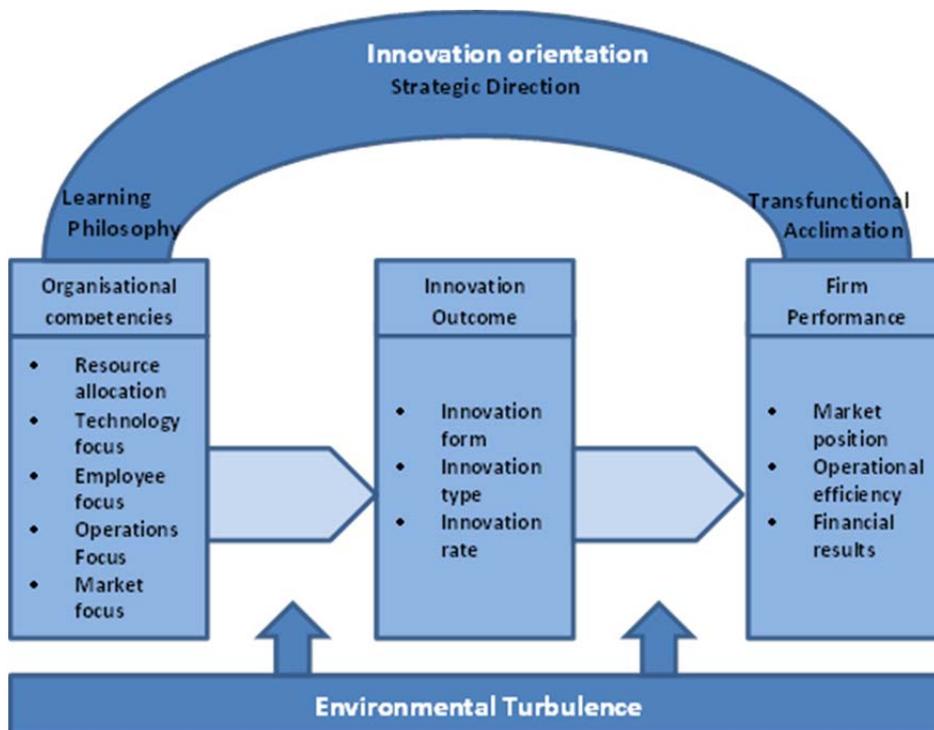


Figure 33: Innovation orientation: drivers, actions and outcomes.

Source: (Sigauw *et al.* 2006, p. 561).

Innovation orientation refers to an organisations' attitude to new ideas and its ability to introduce new products, processes or ideas, in other words its intention to innovate (strategic direction) (Kundu & Katz 2003). Innovation behaviour of an organisation refers to the yield of new products or services, either developed or introduced. There are two dissimilar modes of innovation (absorptive capacity differs in importance and/or function for attaining these forms of innovative behaviour):

- exploration – requires new knowledge and capabilities that are new to the organization;
- exploitation – expands an organisations existing knowledge.

Figure 34 gives the organisation outcomes of innovation orientation.

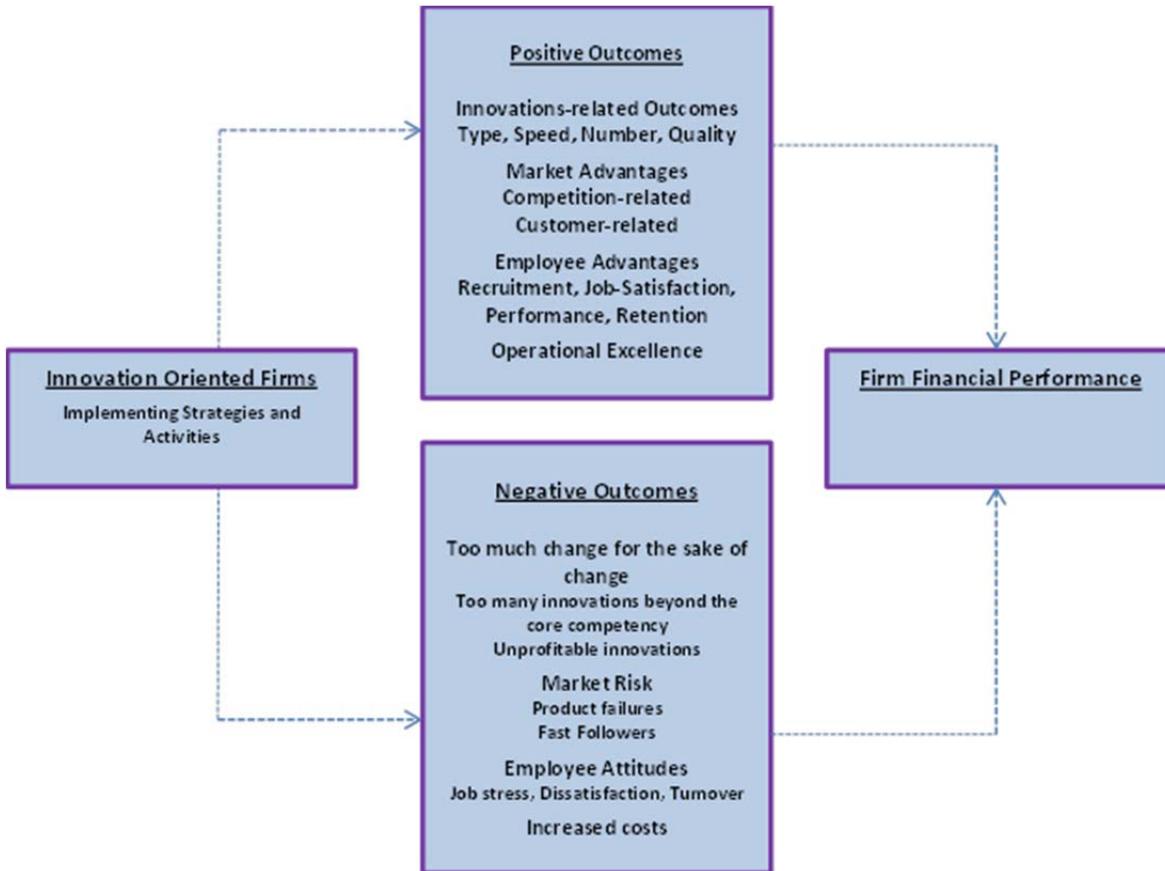


Figure 34: Innovation orientation organisation outcomes.

Source: (Simpson *et al.* 2006, p. 1136).

These outcomes are used to benchmark the success of innovations. Organisations need to avoid: yielding innovations beyond their core competencies; recruiting persons who are change resistant or who are stress averse in a dynamic environment; developing procedures failing to account for positive and adverse costs of innovation.

Institutional innovations enhance market incentives for entrepreneurial activity and technology trading. Achievable innovations are turning into the pivot of success in the global markets through raising the overall productivity and growth. The importance of innovation in relation to economic performance as well as living conditions need to be exaggerated notwithstanding opportunities presented by globalisation and resource scarcities. (Yusuf 2009, p. 1). It is altering the structure of organisations while also augmenting organisations capabilities by taking new ideas, products and practices into the commercial domain.

3.11 INNOVATION CAPABILITY

Knowledge-intensive organisations play a significant role in value creation through innovation, essential for creating and sustaining organisational competitive advantage (Gloet *et al.* 2012, p. 3658). Innovation is defined by Katz (2007) as:

the successful generation, development and implementation of new and novel ideas, which introduce new products, processes and/or strategies to an organisation or enhances current products, processes and/or strategies leading to commercial success and possible market leadership and creating value for stakeholders, driving economic growth and improving standards of living (Katz 2007, pp. 50-55).

The innovation capability concept uses two levels of detail:

- Innovation capability areas, these include the innovation process; knowledge and competency as well as organisational support;
- Innovation capability constructs, these include strategy and objectives; function and processes; organisation and management; data and information and customers and suppliers.

(Essmann & Du Preez 2009).

The capability of organisations to support learning and innovation processes is a vital source in inducing competitive advantage (Cooke & Morgan 1998; Lundvall & Johnson 1994; Henry & Pinch 2000). It is hence critical that employees who are willing to accumulate and share knowledge contribute directly to the organisations' innovation capability (Lin 2007, p. 315). The sharing of knowledge (social interaction culture) in the process of enhancing innovation capability provides opportunities to organisations to generate solutions and efficiencies, eventually contributing towards a competitive advantage (Reid 2003). Knowledge sharing encompasses a shared understandings allowing access to relevant information and building and using knowledge networks within the organisation (Hogel *et al.* 2003). The process of sharing occurs on individual and/or organisational level (Garcia & Calantone 2002; Scarbrough 2003).

Frishammer, Kurkkio, Abrahamsson and Lichtenthaler (2012, p. 519) added by developing a conceptual framework of organisations' process innovation capability

through the analysis of multidisciplinary literature on managing process innovation. This capability-based perspective defines capability as an organisations' 'ability to acquire, assimilate, transform and exploit technically related resources, procedures, and knowledge for process innovation purposes' (Frishammer et al, 2010, p. 519). A framework in this context is important in assisting organisations to manage process innovation in order to realise their potential benefits. The conceptual framework is given in Figure 35.

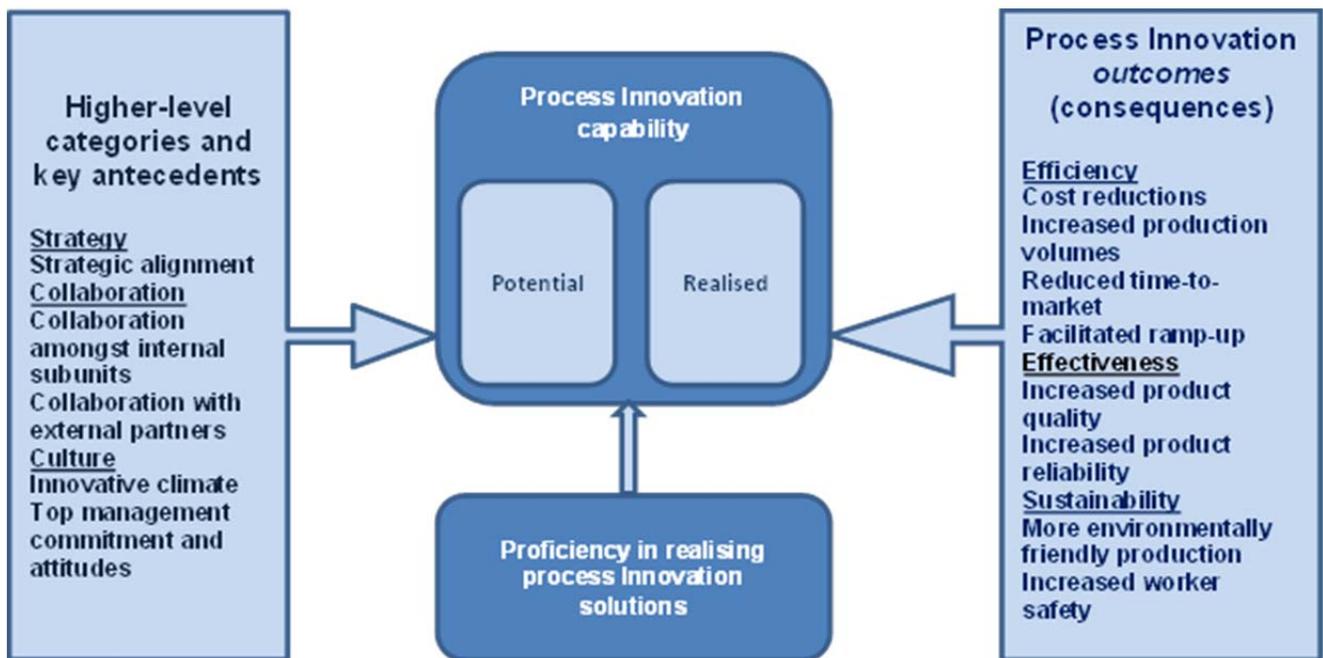


Figure 35: Conceptual framework of firms' process innovation capability.

Source: (Frishammar *et al.* 2012, p. 522).

The Dynamic Capabilities Theory is appropriate for organisational innovation studies as:

- technology is not emphasised which facilitates the development of a holistic model of organisational innovation; and
- the innovation process can be associated with new product development as well as new processes, business models or systems.

The performance obstacles for success have significantly increased as organisations focus more on innovations. Within organisations the innovation process can be managed

(organisational capability), systematised and replicated, as innovation comprises core elements and processes, irrespective of the industry or the organisation.

Organisations possessing high levels of innovation capability can integrate key capabilities and resources within the organisation to successfully stimulate innovation. Such organisations can unremittingly transform knowledge as well as ideas into new products, processes and systems, to the benefit of all. By blending these two operating paradigms, the matching up of the mainstream paradigm with the creativity of the new paradigm, is brought together by leveraging the knowledge base (Cohen & Levinthal 1990). This linkage is understood by high-performing innovators. They are able to connect the innovation meta-capability and link essential mainstream management skills with a business model for innovation to achieve exceptional performance. A model of innovation capability is given in Figure 36.

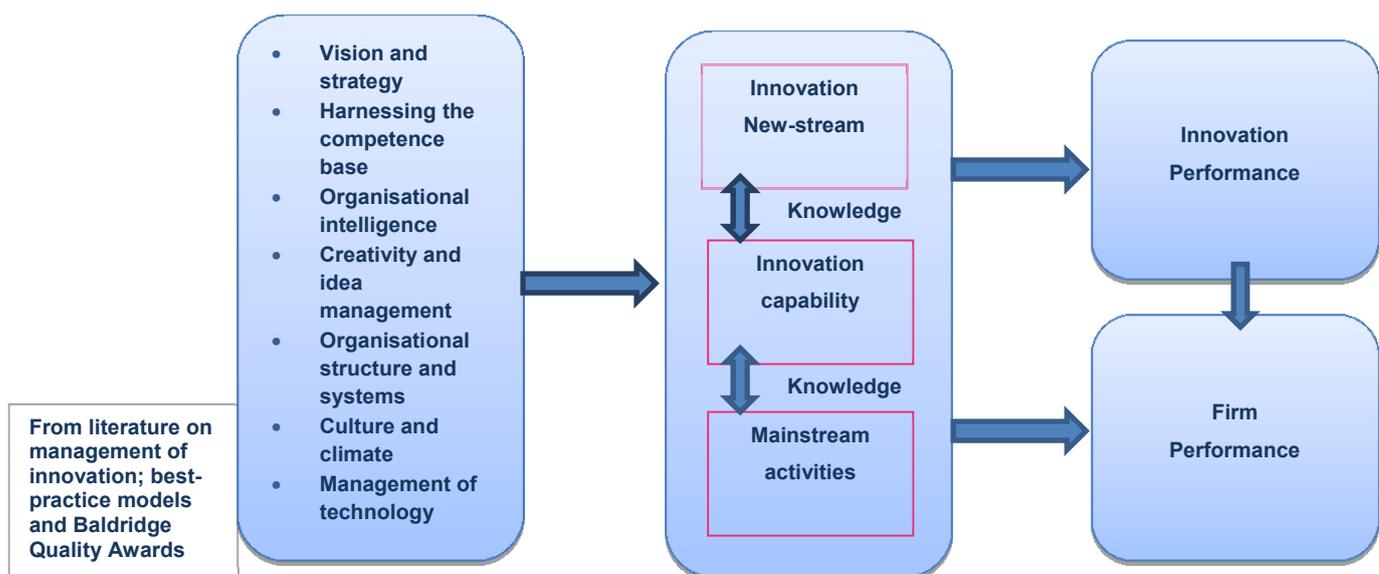


Figure 36: Model of innovation capability.
Source: (Lawson & Samson 2001, p. 388).

Saunila, Pekkola & Ukko (2014:245) conclude by empirically determining the positive moderating effect between innovation capability and organisational performance. 'Organisations that measure the determinants of innovation capability, especially through

active exploitation of external knowledge, are more likely to engage in a higher level of innovation capability, which in turn has a positive impact on their performance’.

3.12 CONCLUSION

Chapter 3 has explained the concept knowledge and its strategic value within knowledge workers. Learning as a human endeavour was extended to organisations and the management and absorption of knowledge in organisations, to achieve strategic value, was explored.

CHAPTER 4: LITERATURE REVIEW - INNOVATION

4.1 INTRODUCTION

If, as is generally conceded, the world is in a rather sorry mess, crying for solutions to problems that are staggering in complexity and magnitude, the encouragement of creative thinking would seem to be the most necessary and immediate goal of all concerned people (George R Eckstein (Citat från De Miranda, Aranha & Zardo, 2009)).

One of the most significant qualities of the last decade has been organisational transformation, rooted in change and steered by knowledge. Change is defined as transformation over a period that expands from organisation-wide transparency to modest incremental change (Child 2005, p. 288). Innovation in an organisation that results from creative ideas is born from a necessity to change in order to compete commercially, rather than reacting to change. The transformation in the ecosystem that it creates can lead to sustainable competitive advantage by forcing other organisations to respond. The viability of organisations is preserved by nurturing innovation as a dynamic change process concerned with modification of patterned behaviour.

Innovation is emphasised as one of the paths to surviving intense competition in a global information age and growing and extending organisational transformation in order to enhance performance (Shui-Yee Wang 2007, p. 1290). Innovation unfolds in a manageable series of dynamic phases, and it is critical to be aware of where and how innovation originates and how the adoption of innovative ideas can be nurtured. The process of innovation can be facilitated by an improved appreciation of the innovation concept and context, in addition to the adoption of innovation as an instrument for continuous improvement. This understanding is complicated by the additional challenge that the nature and definition of innovation is still a 'work in progress,' and ambiguous circumstances complicate the understanding of the concept (Amabile 2005). Innovation is realised by persons with extensive individual characteristics as well as backgrounds.

Economies have moved to a more internationally unified, entrepreneurial and assorted constructive fabric. The GCR in Chapter 1, highlighted the fact that substantial gains can be achieved by countries in the global sphere by improving on all the factors used for the

calculation of competitiveness. Innovation being the single most critically important and successful driver of growth is confirmed by the observation that, 'In the long run, standards of living can be expanded only with innovation' (GCR 2009–2010). Innovation modifies the shape and improves the abilities of organisations. In light of the prospects offered by globalisation as well as the multitude of trials the world faces, the importance of innovation for economic performance as well as living circumstances cannot be stressed enough (Yusuf 2009, p. 1). Concepts used in the successful implementation of creative ideas that provide impetus and content for many forms of innovation in pursuit of sustainable change, are summarised in Table 61.

Table 61: Summary of the concepts of creativity, innovation, and change.

Concept	Definition
Creativity (unique human quality)	<ul style="list-style-type: none"> • Thinking process that drives employees to generate new and useful ideas on the speed, direction, and choices for change (Henry, 2006). • These processes need to be managed and require the creation and maintenance of environments that stimulate and encourage new ideas to flourish (De Brabandere, 2005). • Starting point for innovation (necessary but not sufficient for innovation) Amabile (1996: 1154-1155). • Focus on cultures that promote shared values and attitudes while encouraging the generation of new ideas. Linked to domains of knowledge and understanding. • Creativity is a process that occurs within society; it is part of individual and group activities that cannot be fully understood without a broader understanding of the dynamic contextual interplay between our social life, innovation experiences and our attention to various business tasks and organisational activities. • Creativity provides impetus and content for many forms of innovation.
Innovation	<ul style="list-style-type: none"> • Conceptualised as the translation of new ideas into commercial products, processes and services (Bessant & Tidd, 2007:29). • (Amabile, 1996: 1154–1155) Innovation is the successful implementation of creative ideas within an organisation. • <i>Dimensions of innovation:</i> <ul style="list-style-type: none"> ○ production innovation ○ process innovation ○ position innovation ○ paradigm innovation • <i>Levels of innovation:</i> <ul style="list-style-type: none"> ○ incremental ○ modular ○ radical • <i>Types of innovation:</i> <ul style="list-style-type: none"> ○ product ○ service ○ process ○ management ○ market or position • <i>Consists of two parallel processes:</i> <ul style="list-style-type: none"> ○ new appropriate ideas / inventions are explored in a creative way;

	<ul style="list-style-type: none"> ○ these ideas are aggregated, selected, diffused, implemented, exploited.
Change	<ul style="list-style-type: none"> • Movement over time that may involve company-wide transparency through to small-scale incremental change (Child, 2005:288). • Stimulus: <ul style="list-style-type: none"> ○ proactive strategies ○ reactive responses to internal problems or external business market pressures • Four dimensions of change: <ul style="list-style-type: none"> ○ substance of change ○ scale and scope of change ○ politics of change ○ timeframe of change • Four triggers of change (Leavitt, 1964): <ul style="list-style-type: none"> ○ technology ○ primary task ○ people ○ administrative structures
Entrepreneurship	<ul style="list-style-type: none"> • Goes hand in hand with innovation as new markets and opportunities are identified and exploited in the pursuit of profits and the drive for growth (Bessant & Tidd, 2007).

Source: (Own compilation from the literature).

Concepts of innovation, change and creativity overlap and interlock in ultimately a synergetic fashion (Andriopoulos & Dawson 2009). Innovation, a way of altering an organisation, is about growth in 'response to changes in the external environment or as a pre-emptive action to influence the environment' (Damanpour 1996, p. 23). Growth in this sense contains an understanding of a shared intuition of what is needed and valued outside the organisation, the creativity to produce timely new ideas, and a factor of commercialising it (Patnaik 2010, p. 5). To be typified as an innovation, positive diffusion of original products or processes is required. According to Porter (1990), innovation describes the process to create original, new or enhanced products, services or processes. Innovation is restricted by the context in which it is happening, and the differentiation in change is brought about through the magnitude of the change and the nature of the change. To ensure successful innovation, it is necessary to balance the requirements of the innovation with the needs of the organisation to continue to support these activities effectively (Kline *et al.* 2000, p. 277).

The process of innovation transforms valuable ideas into novel shapes of economic value for all stakeholders. This process of knowledge-creation by way of a transformation

process alters existing information into novel knowledge as a form of social capital. This transformation process (implicit knowledge converted into explicit knowledge) is an organisational learning process to preserve continuity based on innovation grounded in creativity (Merx-Hermin *et al.* 2005, p. 137). Such modification between specific and shared transformation is vital for organisational innovation.

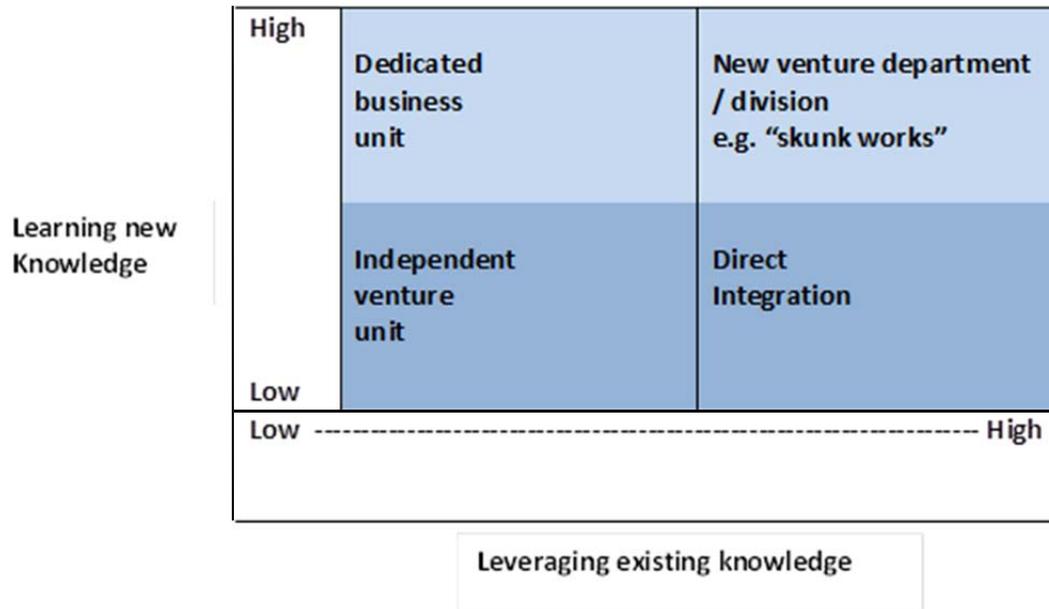


Figure 37: Typology of corporate venturing.
Source: (Tidd & Taurins 1999, p. 229).

To induce innovation in an economic context, a multitude of factors need to interact (Johannessen *et al.* 2001) that support organisational competitiveness. The concept innovation is ambiguous. It lacks a distinct definition and measure (Adams 2005, p. 22) but signifies the crucial regeneration process in an organisation. (Bessant *et al.* 2005, p. 47). Innovation is a process, and is diagrammatically depicted in Figure 38.

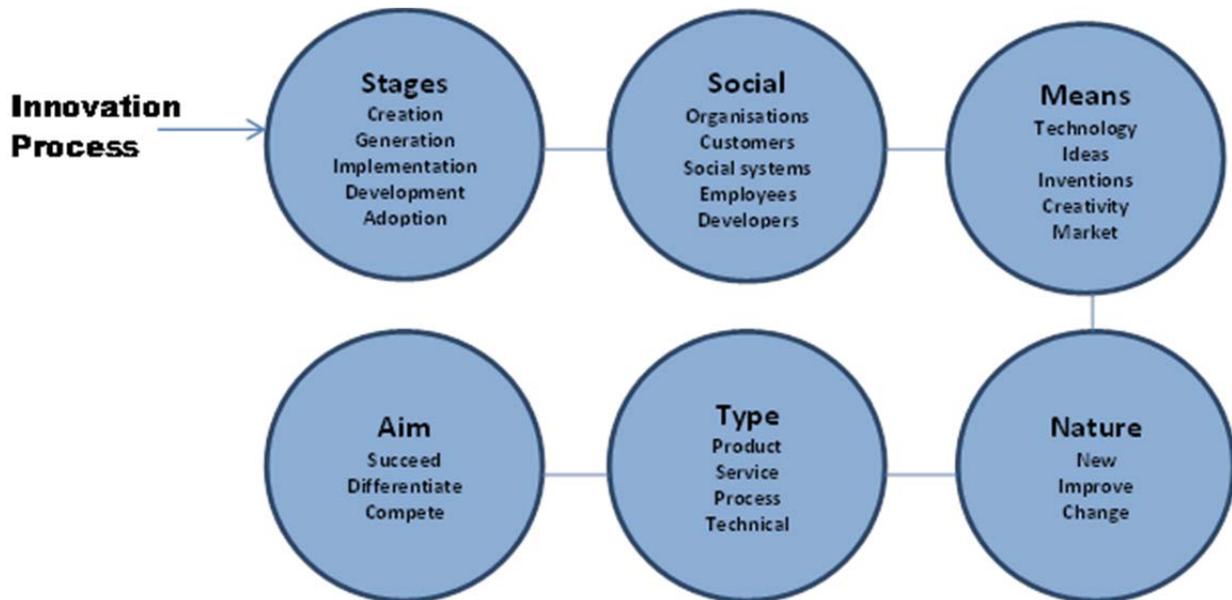


Figure 38: Diagrammatic definition of innovation.

Source: (Baregheh *et al* 2009, p. 1333).

Baregheh *et al.* (2009, p. 1334) describe innovation as: ‘the multi-stage process whereby organisations transform ideas into new/improved products, services or processes, in order to advance, compete and differentiate themselves successfully in their marketplace’. It can therefore be deduced that innovation is an essential element of an organisations’ performance and competitiveness and forms the base for organisational survival (Damanpour & Evan 1984; Han *et al.* 1998). Organisational innovativeness depends on the effective generation of ideas, as well as the effective implementation of some of these ideas (Steiner, in Pradip 2004, p. 15). Creativity and innovation are understood to be a function of an interaction between an individual and a situation (Hunter *et al.* 2007). This insight necessitates a better understanding of factors influencing economic creativity leading to innovation, labelled a collective activity (Williams & Mc Guire 2010, p. 395).

The concepts creativity and innovation are competitive advantages in the new economy that lead to change. This chapter analyses the link between them, and explores the economic setting, classification and the various kinds of innovation. It underlines the discourse of theories about innovation, and discusses the drivers of innovation adoption by debating the enablers and inhibitors of innovation, using the diagram in Figure 39 as a framework.

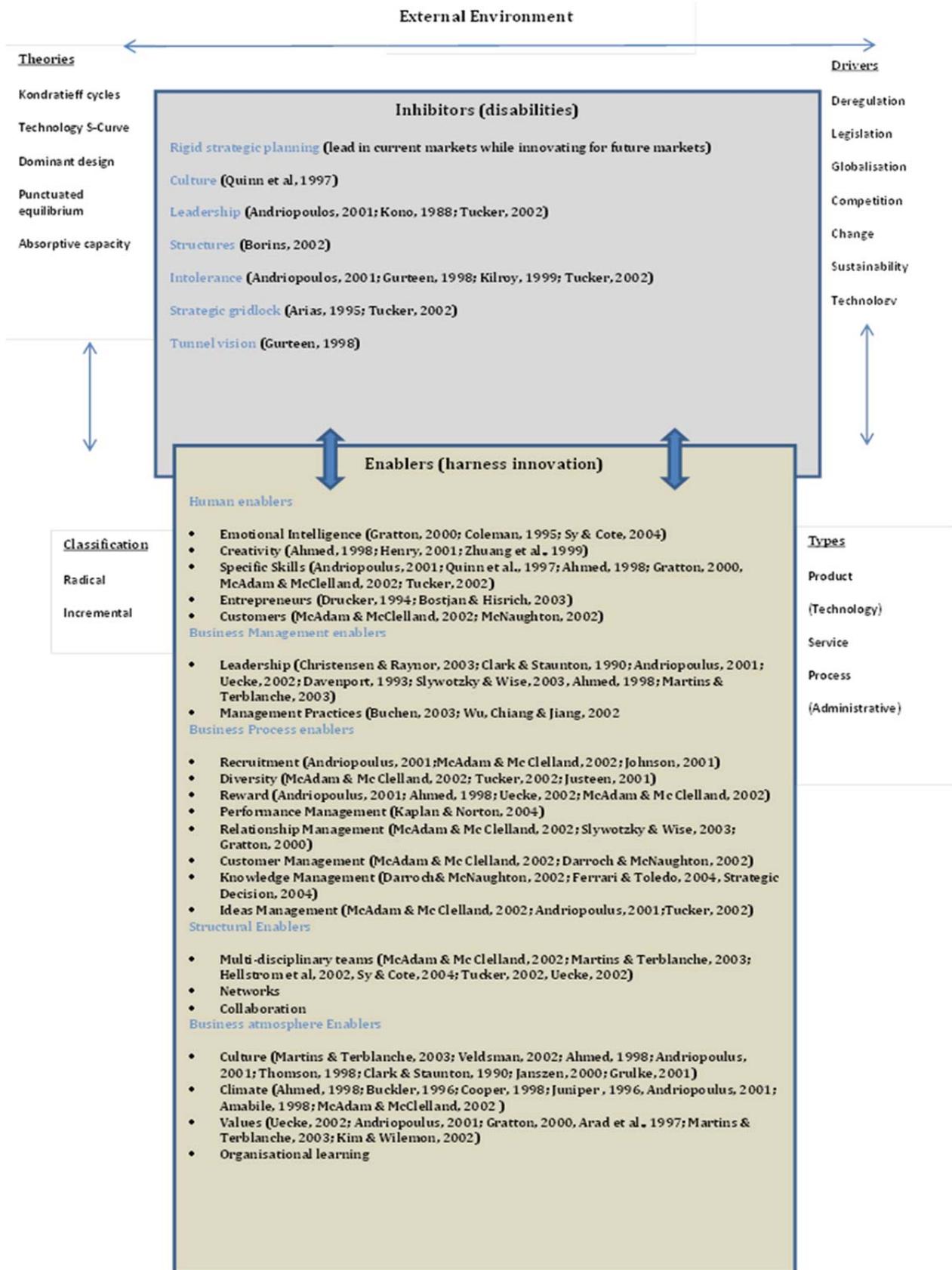


Figure 39: Framework for Innovation adoption.

Source: (van Zyl et al., 2005, p. 76).

4.2 CONCEPT OF CREATIVITY

Creativity holds an action orientation referring to an emergent, highly transferable, quality that strongly relates to personal effectiveness (University of Huddersfield, TQEF Project 2010). It is a mental activity, comprising the construction of novel ideas, conceptions, methods or actions that can lead to the development of previously unknown artefacts, insights or interpretations. It can also involve the recombination or modification of what is already present and is multiplex taking on many forms. Creativity operates along a continuum and needs divergent thinking regarding what may be unrealised, unverified or experimental. Creativity could be knowledge-driven or vision-driven, and may be regarded as an idea generating process (Lawson & Samson 2001, p. 392). As an interdisciplinary field searching for meaning (Armato 2009), it is a uniquely human quality and serves as the starting point for innovation (Amabile *et al.* 1996, pp. 1154-1155). It is found in a diversity of settings and is demonstrated by individuals. (Adams 2005, p. 4). Creativity is defined by Woolfolk (2008, p. 366) as 'imaginative, original thinking or problem solving' leading to an intended outcome and supported by creative and critical thinking. Creativity impacts on organisational performance but the relationship between them is contingent on risk orientation, organisational size and realised absorptive capacity (Gong *et al.* 2013, p. 443).

Truly creative people persistently try to identify, break or create designs to seek out connections between items – in pursuit of making meaning (Armato 2009). Creativity is part of individuals' intellectual efforts and drives the thinking process of employees to generate new and useful opinions on the direction, pace and selections for change (Henry 2006). According to Amabile *et al.* (1996), creative thinkings' main features are the ease in differing from others; exploring resolutions different from the existing state of affairs by persevering in spite of challenges; by reflecting and then restarting with a renewed point of view; linking knowledge with prior dissimilar fields (Amabile *et al.* 1996). It has been shown through theory and research that employees can be creative when (Politis 2005, p. 183):

- ideas are supported and assessed by organisations (Cummings 1965; Kanter 1988);

- employees jointly commit to projects (Monge *et al.* 1992) and are resourced sufficiently to perform these projects (Delbecq & Mills 1985);
- employees have autonomy and control (King & West 1985) over intellectually emboldening work (Amabile & Grysiewicz 1989); and
- employees are rewarded as well as recognised for their creativity (Amabile *et al.* 1996).

Organisations need to create an organisational context and an environment that strengthens idea generation and creative thinking (Amabile 1998). To cultivate an environment that facilitates the creativity of subordinates and makes creativity practical in the workplace, managers need to be tasked to (Kohli & Jaworski 1990):

- encourage creative problem-solving;
- familiarise themselves with a range of problem-solving approaches;
- gain knowledge of different ways associated with problem solving approaches;
- lead in a manner that enables subordinates to generate ideas; and
- evaluate and select the most effective ideas.

(International Federation of Training and Development Organisations 2005, p. 11).

The concept of creativity is complicated by the fact that, depending on the subject area under discussion, differences are found in the definition of the word. In studies among different student groupings, Glück *et al.* (2002, p. 56), found different perceptions of creativity associated with different professions such as artists, graphic designers or architects. The studies did, however, agree that any creative person needs numerous ideas as well as the ability to solve problems. Participants in the studies agreed that creativity often meant hard work and solving practical problems, in often complex situations.

A unique difference between artistic and scientific creativity is that scientific discovery only acknowledges confirmations, while artistic creativity inspires replication (Legrenzi 2010). More functional knowledge has been generated by the scientific approach serving as the catalyst for creative advancement towards successful innovations (Yusuf 2009, pp. 2-3). It is also necessary to distinguish between acting creatively, which is conscious,

periodic and primarily externally motivated, and being creative, which is unconscious, ongoing and primarily internally motivated (Armato 2009). True creativity needs to solve a problem in a novel way to fit a situation or reach a goal by sustaining an original insight until the end (Botha 1999, p. 35).

Treffinger and Selby (1993, p. 335) argues that a structural outline of creativity perceptions has yet to be accomplished (Kaufmann 1993). Mumford and Gustafson (1988) argue that the prerequisites for producing creative products may be diverse, depending on the specific work-related type of problems being confronted and that variability in the disposition of creative behaviour can be expected. In the literature the notion of distinct variances between conceptions of creativity, may well contribute to more insight into the distinctions and convergences with reference to findings on scientific and artistic creativity. Taking variances into account may help to build a definition of creativity explaining the variances in research results. Table 62 summarises the multiple dimensions of creativity.

Table 62: Dimensions of creativity.

	ECONOMIC	SOCIAL	CULTURAL	SUSTAINABLE
The multiple aspects (or dimensions) of creativity	Trade-related issues: flows of goods and services	Emancipation: employment generation and wealth distribution	Value (cultural and economic) creation: standing side-by-side	Capital: tangible and intangible assets for future generation

Source: (Miranda *et al.* 2009, p. 525).

In innovation driven countries creativity is a determining factor of economic growth (see Chapter 1). These countries are moving towards information-based, knowledge-driven 'creative industries' (Bridgestock 2010). Interest in creativity, the level of creativity, along with the forms it can take, are shaped by culture as well as tradition. Creativity, a fundamental component in an assortment of industrious activities is necessary, but not sufficient, to enable innovative change. To stimulate and encourage novel ideas to be successful, supporting environments need to be created, established and maintained, while processes need to be managed (De Brabandere 2005). Creativity cannot be

mandated, but it can be enhanced and encouraged. By feeding enquiring minds one can maximise the output by way of augmenting the input (Austin 2009, p. 21).

Constant differentiation between businesses to compete in a high paced business environment relies on harnessing the creativity of the employees in the business. Creative idea-generation of employees is important for incremental change or stepping outside of the current paradigm (for re-engineering of business processes). Idea-generation processes can be used to influence the type of ideas, as well as different degrees of paradigmatic shifts in thinking, as presented in the ideas generated. Ideas as such are categorised in terms of a continuum, from a paradigm-preserving to a paradigm-modifying level, depending on the degree to which they alter the current paradigm. These paradigmatic shifts are influenced by external stimuli, of which group memory is a key source (Satzinger *et al.* 1999, pp. 144-146). These different types of ideas are depicted in Figure 40.

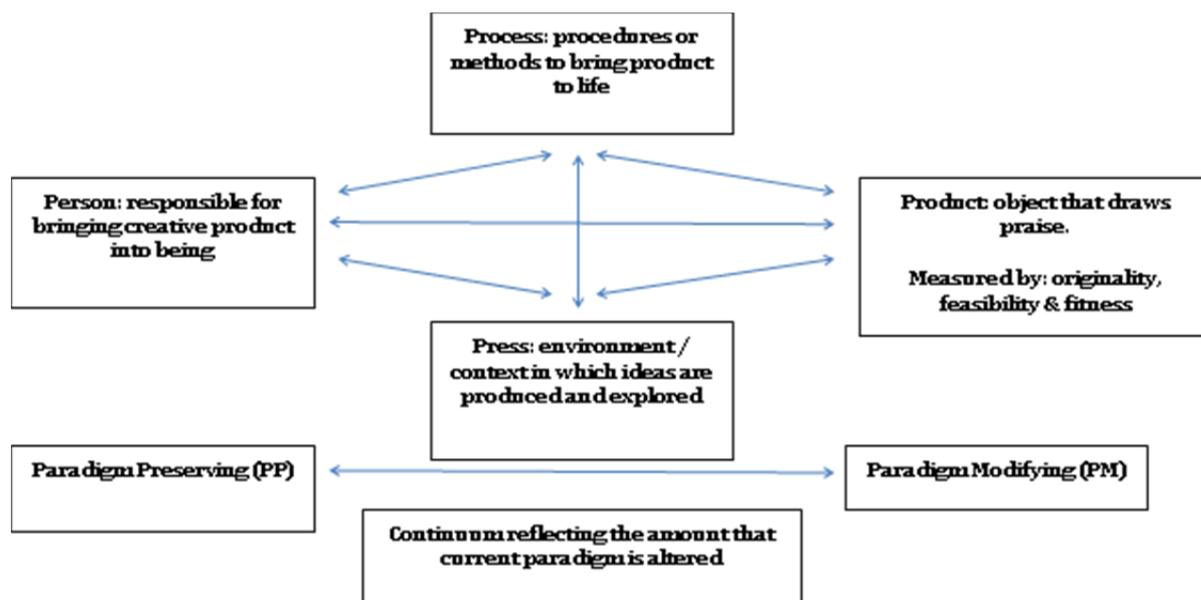


Figure 40: Different types of ideas — equally creative but different in form.

Source: (Satzinger *et al.* 1999, p. 146).

Creative interests, degrees of creativity and the forms of creativity are a function of how culture and traditions are mobilised. It is conceivable that the physical, emotional, and

intellectual quality of human resources will influence creativity, therefore investment in human capital, is a necessity to raise both the volume and the quality of creativity. The economic criterion favours innovations leading to commercial results (Yusuf 2009, pp. 3-7) as depicted in Figure 41. Even though the source of creativity is human talent, the activity of innovation needs a significant expenditure of time and resources on an extended and costly process of development and commercialisation (Yusuf 2009, pp. 3-7).

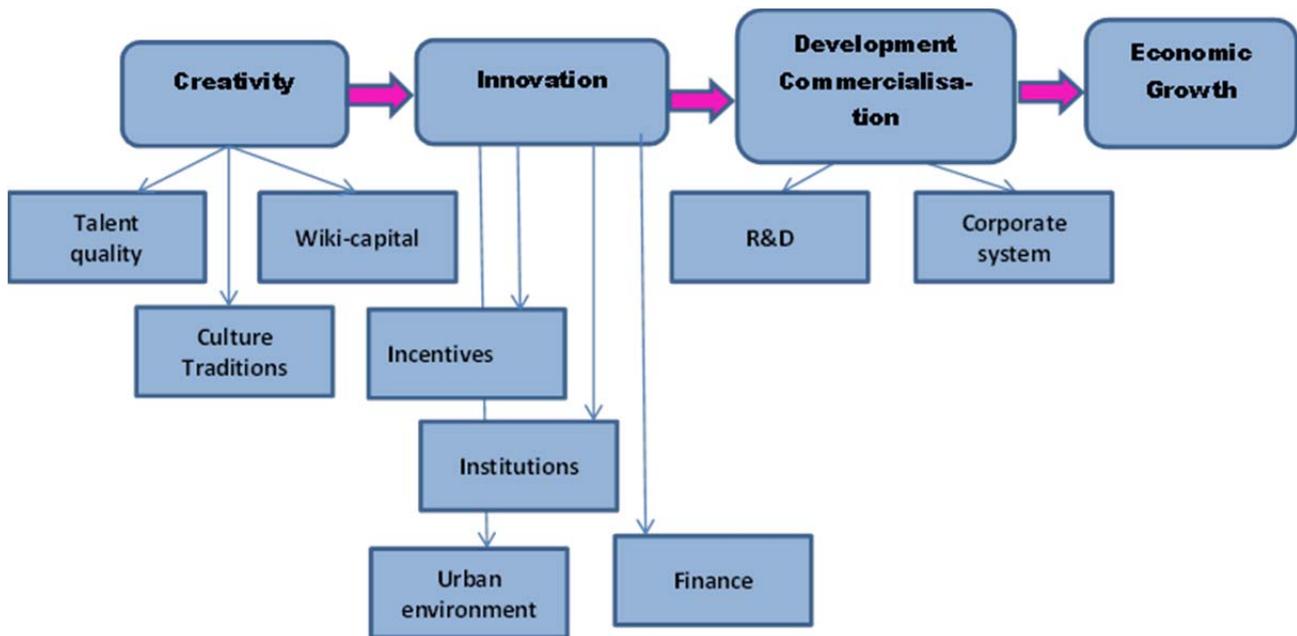


Figure 41: Creativity and economic performance.

Source: (Yusuf 2009, p. 2).

To enhance the appreciation of the association between innovation and creativity, characteristics and processes that initiate the nurturing of ideas and, ultimately, higher levels of creative thinking need to be explored. Creativity is a process that occurs within society; it is part of individual and group activities that cannot be fully understood without a broader understanding of the dynamic contextual interplay between our social life experiences and our attention to various business tasks and organisational activities. Within this paradigm of thinking, results of research done by Goncalo & Staw (2005, p. 96) suggest that individualistic (independent) values are especially beneficial when

creativity is set as a principal goal; individualistic groups instructed to be more creative outperform collectivistic groups (interdependent)) when given the same instructions.

An organisation's successful adoption of creative ideas can result in new business processes being introduced or old ones being transformed within the organisation, or products and services being transformed. Processes incorporating creativity and innovation are complex, partly iterative and partly simultaneous (Haner 2005, p. 288). Such processes move organisations from efficiency to a new level of creating better experiences and services for consumers and service beneficiaries, and innovation in new arenas. Creativity, distinct from innovation (Shalley *et al.* 2004), is every so often understood as either a prerequisite or a necessity for innovation (West 2002). How creativity is perceived and managed influences whether its outcome results in innovation or not (Isaksen & Ekvall 2010).

Creativity, being the production of ideas, is perceived as the commencement of innovation. Creativity is also linked to domains of knowledge and understanding, and provides the impetus and content for many forms of innovation (Andriopoulos *et al.* 2009, pp. 6-42). Innovation, on the other hand, is about turning these ideas into action, and eventually commercialising the innovation (Smith 2009, p. 7). Acknowledging creativity's tactical function in the innovation-competitiveness ladder, businesses realise that the creativity and innovation of the labour force has become critical for launching and preserving a competitive benefit. To be successful in a global economy, more is needed than the logic and linear thinking and analysis functions located in the left side of the human brain.

Amabile, regarded as a pioneer in the field of creativity, developed the Three-component Model that defines creativity by relating interconnected concepts. This model proposes that creativity is a function of expertise, creative thinking skills, and motivation (Antonites 2003, p. 81), as illustrated in Figure 42:

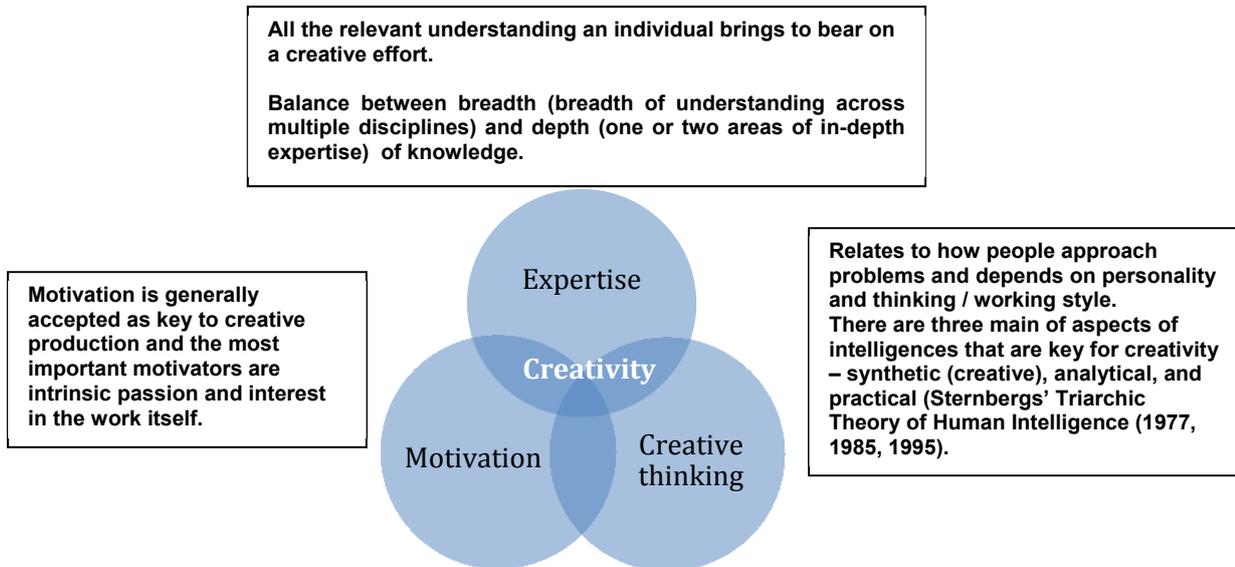


Figure 42: Three-Component model defining creativity.

Source: (Adapted from Antonites 2003, p. 81; Adams 2005, p. 5).

In this model, there needs to be equilibrium taking into account the depth and breadth of knowledge, so that our creative potential can be maximised. This can be achieved by a greater focus on interdisciplinary study and teaming up with people with different knowledge bases. Creativity is further encouraged by a non-threatening, non-controlling climate that complements and encourages idea combination and recombination (Adams 2005, p. 6). The dimensions recognised as essential to a creativity climate are:

- The stimulant dimensions are:
 - organisational encouragement – including an encouraging culture of creativity; reward combined with recognition for creativity; and a common vision;
 - managerial encouragement – managers who serve as good work models; support the group; set goals; and values individual contributions;
 - support to work group – group is diversely skilled; good communication skills; constructively challenged and receptive to new ideas; trust and committed;
 - freedom – a belief that one is in control of your own work;
 - adequate resources such as information, funds, materials, facilities; and
 - thought-provoking work – a sense of challenging and noteworthy assignments.
- The impediments are:

- organisational barriers – an impeding culture of creativity; avoids risk and emphasises the current situation; reproach of revolutionary ideas; destructive politics; internal competition; and
- work-load demands – an intense time pressure; unrealistic expectations; and distractions from creative work.

(Lin & Liu 2012, p. 60 — adapted from Anabile *et al.* 1996).

Creativity, which drives innovation, is not necessarily a gift but a creative thinking process or else the consequence of a creative thought (Eysenck 1994); it can be learned and often requires an altered working environment (Montenegro, in Hernandez 2010, p. 45). Engagement in a disciplined process is required to create a new level on which original and novel ideas could be generated, through the simultaneous activation of diverse, often unrelated, ideas or categories (Rothenberg 1996). Product-oriented creativity is the result of the interplay between divergent and convergent thinking processes (Kharkhurin and Motalleebi 2008, pp. 404-405), satisfying the requirements of novelty appropriateness, and usefulness (Lubart & Sternberg 1995).

Inventiveness, adaptability, and productivity require creativity to occur, and are important for functioning and prospering in an innovation economy. People, especially in the knowledge economy, need to team up and blend in creative and bold ways in their knowledge, skills, and capabilities, to identify and solve complex problems (Norman 2006, p. 3). Creativity generates new ideas while innovation realises, implements, and tests creative ideas (Fagerberg & Srholec 2005). Innovation is a complex social phenomenon, and is seen as a highly uncertain process that encapsulates complexity and uncertainty, while being subject to many kinds of change. It must therefore be seen as a series of changes in a complete system that is hard to measure effectively (Kline *et al.* 2000, p. 275).

4.3 COMPLEXITIES THAT SHAPE CREATIVITY

A competitive economy needs to be strengthened by creative individuals instilled with a scientific philosophy. Yusuf (2009) describes three requirements to be fulfilled in order to increase the proportion of creative people in a society:

- cultural reinforcements that value learning and promote talent; quality schooling supporting the cultural environment; the ability to communicate complex information; and working in groups;
- developing human capital by way of better health from childhood as creativity is influenced by not only the intellectual quality of human capital but also the physical and emotional qualities;
- students and researchers need to specialise more to attain the appropriate level of mastery over a limited subfield to develop new knowledge. The prerequisite suggests that:
 - initial discoveries are made at more advanced ages, limiting innovators productivity, particularly if the ability required in a number of fields is highest when individuals are young; and
 - teams are proportionately discovering more by bridging relationships.

(Yusuf 2009, pp. 2-3).

Climate studies scrutinise employees' perceptions, as well as experiences, in their immediate work environment, pertaining to dimensions of support and autonomy (Hunter *et al.* 2007, pp. 69-70). The importance of climate is underscored by these studies in that:

- creative people, in particular appear reactive to climate variables (Oldham & Cummings 1996);
- individual and group level climate perceptions are effective predictors of creativity and innovation (Tesluk, Farr & Klein 1997); and
- climate assessments provide a basis for organisational interventions that have demonstrated helpful in enhancing creativity and innovation (Basadur 1992; Schneider, Gunnarson & Niles-Jolly 1994).

Climate (e.g. for creativity or service) is a domain-referenced occurrence where manifold dimensions come into effect to shape performance in the domain under consideration (Hunter *et al.* 2007, p. 70). Table 63 summarises the attributes of creative people and the environmental variables that induce creativity.

Table 63: Multiple variables or dimensions that shape creativity.

Dimensions	Attributes	Researched by:
Attributes of creative people	expertise	Ericsson & Charness, 1994; Rich & Weisberg, 2004
	information processing strategies	Lubart, 2001; Mumford, Supinski, Baughman, Costanza & Threlfall, 1997; Ward, Patterson & Sifonis, 2004
	abilities characteristics	Sternberg & O'Hara, 1999; Vincent, Decker & Mumford, 2002
	personality characteristics	Barron & Harrington, 1981; Feist, 1999
	Variables	
Environmental variables influence on creativity and innovation	collaborations	Abra, 1994; Bullinger, Auernhammer & Gomeringer, 2004
	group interactions	Rickards, Chen & Moger, 2001; West, 2002
	leadership	Amabile, Schatzel, Moneta & Kramer, 2004; Howell & Boies, 2004
	organisational structure	Cardinal & Hatfield, 2001; Damanpour, 1996

Source: (Hunter *et al.* 2007, pp. 69-70).

The escalating pace of change and overwhelming levels of complexity has heightened expectations for improved performance and poses challenges for people to meet. Isaksen and Ekvall (2010) adds debate and reduced levels of conflict as contributors to creating the suitable climate for individuals to jointly build upon ideas and suggestions. The authors continue by arguing that creativity involves tension in addition to conflict by encapsulating three types of conflict that coexist within organisations, embedded in structures and systems: task conflict; emotional, relationship or affective conflict; and process conflict.

Andriopoulus and Dwason (2009, p. 25) posit that creativity is a process that occurs within society. It is part of individual and group activities that cannot be fully understood without a broader understanding of the dynamic contextual interplay between our social life experiences and our attention to various business tasks and organisational activities. The natural process of developing and expressing creative capabilities is tarnished by the

traditional school system, which does not tolerate a culture of nurturing new ideas. The creative challenge of education is to nurture creativity, starting at school level, by designing environments not only for learning, but, more importantly, for thinking. Thinking includes the scope of all kinds of thinking, including critical, creative, constructive, independent, logical, liberal, and analytical thinking. The challenge to create these learning and thinking environments was emphasised by Paul Torrance (1995) in his seminal contributions of 'thinking about creativity'. He highlighted the fact that schools have to produce men and women who can make new scientific discoveries by adapting to change and maintaining sanity in this age of acceleration.

Torrances' (1995) pioneering studies further emphasised that creativity entails divergent thinking and, as such, requires a high measure of sensitivity and autonomy of mind, which is not catered for by default in the learning process. Training is rooted in being logical and rational, while creativity distinguishes itself through reflectivity or the capacity to renew and re-invent one's own view of the world. Being a specialist in one field and borrowing an idea or technique from another special field and applying it to one's own field, results in pushing forward frontiers of knowledge. This diversity of interest and the right to explore new and possibly unpopular ideas lies at the base of problems of academic freedom (Torrance 1995).

All children are born creative, and the fostering of their naïve curiosity should start in their early childhood years. Fantasy needs to be kept alive in young people until their intellectual development is such that they can engage in creative thinking. The potential of individuals is ignited through purposeful activity, intrinsic motivation, rigorous honesty, and open-mindedness. This child-centred approach pushes the limits in creating knowledge for the future, which needs to be functional and experimental, and, according to Shen (2008, p. 76), creates the need for modification of teaching practices, policies, and procedures. Fullan (1991, p. 73) recognised that educational change depends on the thinking of teachers and how they inspire their students. Instruction should help students enlarge, enrich, and make more accurate their images of the future. De Villiers, Scheepers and Maree (2015) add to this context by emphasising the fact that 'novel and adaptive thinking skills can thus be cultivated and graduates must be shown how to

transfer their skills and use it in various situations, to solve personal career challenges, as well as organizational and societal challenges'. The need to cultivate creativity in future generations is emphasised by the fact that facilitated creativity offers people unlimited experiences and possibilities.

An understanding of the intangible sources of creativity is essential, as they are entrenched in the nature and definition of creativity itself, and are therefore difficult to identify. Adams (2005, p. 5) alluded to this by stating that the convergence between an innovating individual, their area of expertise along with the social area that evaluates such an individuals' contribution to the area, helps to define the concept of creativity.

Amabile's Five-stage Componential Model identifies key components of creativity at certain stages of the creative process (Andriopoulos & Dawson 2009, p. 23). This framework for creativity identifies five key stages that need to be accommodated in the creative process of identifying and securing novel and practical solutions to identified problems. Multiple sub-processes play a role in creative work, and the quality with which each of these sub-processes is executed hinges on the creativity of the outcome of problem solving. The components of creativity at certain stages of the creative process, are given in Figure 43.

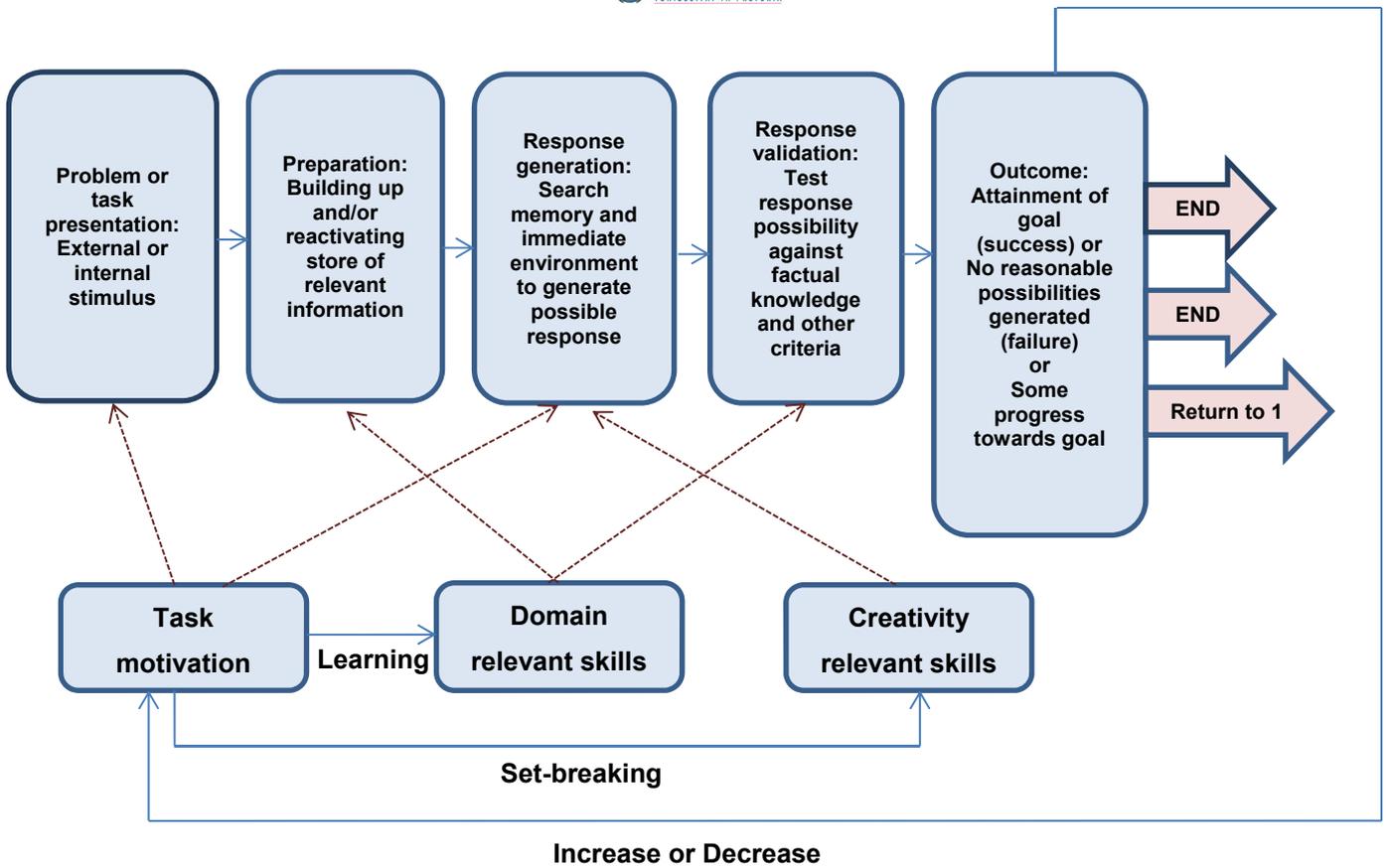


Figure 43: Key components of creativity at certain stages of the creative process.

Source: (Andriopoulos & Dawson 2009, p. 23).

According to the practitioner literature research by Rickards (1999), creative thinking and problem solving are seen as opposites of rational thinking and problem-solving. Creative problem-solving differs from non-creative problem-solving in four main ways, given in Table 64:

Table 64: Creative versus non-creative problem-solving.

Creative problem solving	Routine problem solving
Ill-defined problems.	Routine problem solving.
People must generate new, alternative solutions that involve divergent and convergent thinking.	People apply previously acquired procedures, search for ready-made solutions and tend to satisfy, all of which involve mainly convergent thinking.
Involves active, attention-demanding processing with multiple cycles of divergent and convergent thought.	Proceed in additive fashion, with more direct activation, generation, and application.
Information from existing category structures is combined or reorganised.	Information is recalled and understood using existing category structures.

Source: (Lubart 2001, p. 302).

Legrenzi (2010) found that analysing the processes that lead to creativity, rationality unquestionably constitute barriers. The author continuously stating that framed rationality of individuals is restricted by the information they possess, the cognitive limitations of their minds, and the limited amount of time for decision-making, and gets in the way of a holistic and clear picture, preceding insight. These restrictions influence us by making things simpler, but can also inhibit us from finding that uncreative way. Through discovery and a creative orientation, abstract learning is put into practical action to break out of the mundane organisational box. The moment of insight in the creative problem-solving paradigm is what discriminates creative discovery from ordinary thinking. Rickards (1999), contributes by adding that creativity is regarded as an individualistic and unpredictable process, and is, thus, 'threatening to a deeply grounded belief in rational approaches' by a large number of scholars.

Intellectual expertise is enriched by technical and procedural expertise. Motivation, being the most important component, is divided into intrinsic and extrinsic motivation. Intrinsic motivation includes interest, satisfaction, and challenging work, leading to higher levels of self-worth and a move in the direction of strength-based motivation. Extrinsic motivation, includes synergistic (enabling) elements and non-synergistic (controlling) elements (Amabile 2005, p. 8). Any creative thinking skills can be prejudiced by the ecosystem, and are an indication of how flexibly and imaginatively people approach problems. These

thinking skills should reflect a balance between synthetic, analytical and practical skills (Adams 2005, p. 5). Synthetic thinking manifests in the ability to plan, create and design, whereas analytical thinking is customarily related to the scientific process and is mainly visible in the initial design process (analysing the task; the selection of an appropriate model; and formalisation). These two modes of thinking require different strategies and learning activities in the process of constructing them.

Amabile (Amabile 1988; Hill & Amabile 1993) found from an extensive literature review, that external factors could act as constraints and might hinder the delivery of creative work. It was found that such constraints on creative achievements might be: perceptions of reward and recognition; no free choice of topic or material being used; competitive situations; time pressures to complete; restricted monetary resources; technical possibilities; and external needs relating to the style of the creative product.

Nonaka and Konno (1998) argue that self-management is a frontrunner to creativity as well as productivity in an organisation. It buttresses and promotes the shared interactions between employees needed for creativity and the creative culture. The authors contemplate further that the association between distributed leadership and the energising considerations of the working environment is positive for creativity, while the association between distributed leadership (except encouraging support) and the impediment considerations of the working environment is negative for creativity.

In spite of successful implementations of innovation, Christensen and Raynor (2003) highlight the fact that a limited number of organisations understand what is essential to enable successful innovation. The vexing challenge to managers is to commit to creativity and thus play a key role in setting the tone for innovation by sacrificing interim results for innovation, which is more long-term orientated. Innovation is functional creativity, and as such the principles of creativity need to be kept in mind when seeking to be innovative. In the same line Tidd *et al.* (1997) adds if innovation is a key factor in the growth and survival of a business, it is essential to foster creativity, which leads to innovation. Innovation is about solving problems and as such innovative competence is defined by Prather (2000, pp. 18-19) as the intersection of the three areas of education, leadership

and application. Innovation competence in any organisation requires a systemic approach to all three of these areas. A graphic depicting the three areas of education, leadership and application leading to innovation competence is given in Figure 44.

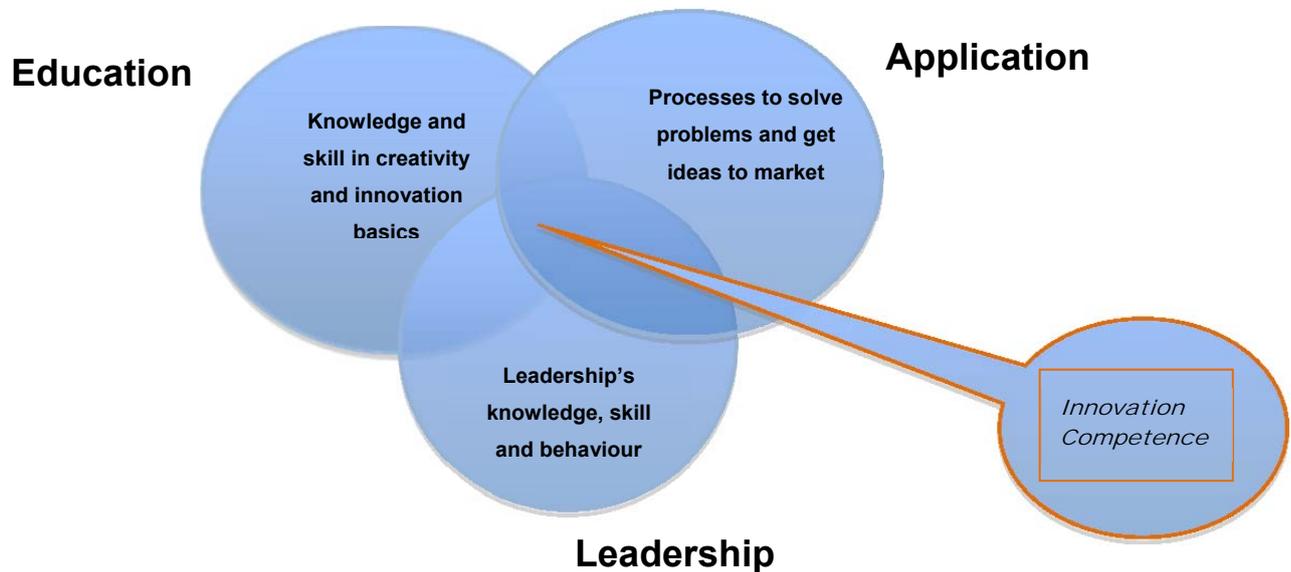


Figure 44: Innovation adoption.

Source: (Adapted from Prather 2000, p. 18).

According to Imber (2011), creativity is a critical competency for staff to possess. The components of creative thinking are identified as the skill to create novel and enlightened solutions, to join forces with others and exchange ideas, and to think creatively when circumstances are challenging . Such creative performance can be predicted by the following (Imber 2011):

- openness to experience – being mindful of your routines and encouraging yourself to explore new things; being open-minded to new experiences and pursuing them;
- creative self-efficacy – confidence in your ability to think creatively. This affects the capability plus the inspiration of people to engage with problem-solving assignments in a creative way;
- resilience – people’s psychological ability to deal with stressful situations and rebound from rejections;
- confidence in intuition (gut feel) - creative thoughts tap into intuitive thinking;
- tolerance of ambiguity –being comfortable with problems without apparent solutions;

- cross-application of experience – drawing on experience from outwardly distinct parts by using analogies to resolve problems.

The above complexities surrounding creativity that result in innovation add to the intricacy of the alignment of the innovation processes, innovation management and innovation adoption, in different independent business units. A discipline operates within a shared set of assumptions, meanings and values. This understanding of business contributes to the manner in which the discipline transacts with its internal and external ecosystem. Contemporary business convention and its unconventionalities view creativity as ‘something to do with’ processes that produce new and valued ideas. Creativity in management studies is perceived as something distinctive that leads to economic and cultural transformation through personal inspiration and actualisation. These creative processes, the initiators of many great commercial achievements, can be partially influenced by deliberate efforts on the part of the creator.

Leveraging a diverse ecosystem to seize new opportunities and grow a business is depicted in the pyramid of innovation in Figure 45.

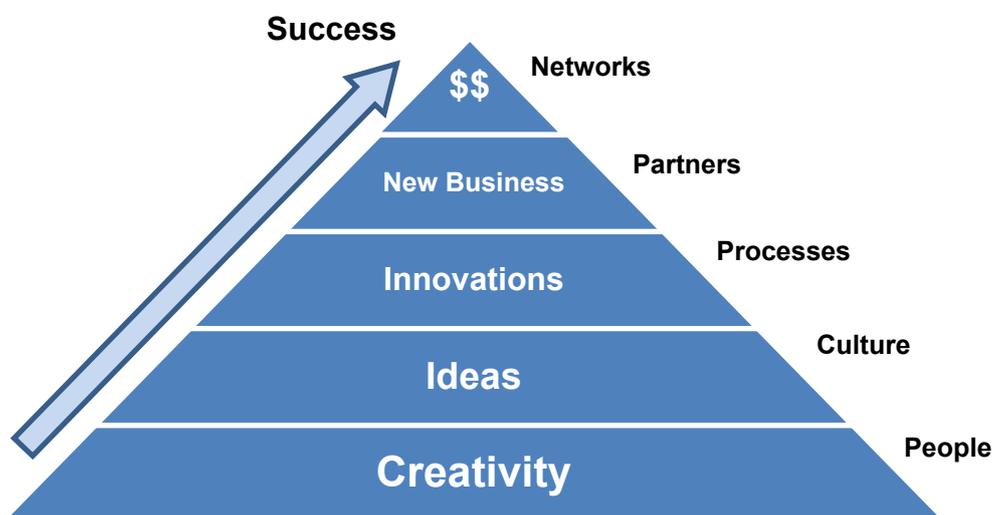


Figure 45: The pyramid of innovation.

Source: (Apple’s Innovation Strategy).

4.4 INNOVATION CONSTRUCT

Innovation consists of the generation of a new idea and its implementation into a new product, process or service, leading to the dynamic growth of the national economy and the increase of employment as well as to a creation of pure profit for the innovative business enterprise. Innovation is never a one-time phenomenon, but a long and cumulative process of a great number of organisational decision-making processes, ranging from the phase of generation of a new idea to its implementation phase. New idea refers to the perception of a new customer need or a new way to produce. It is generated in the cumulative process of information-gathering, coupled with an ever-challenging entrepreneurial vision. Through the implementation process, the new idea is developed and commercialised into a new marketable product or a new process with attendant cost reduction and increased productivity (Urabe 1988, p. 3).

Bessant and Tidd (2007, p. 29) conceptualise innovation as the transformation of novel ideas into saleable products, processes and services. It essentially comprises the market introduction or use of novel or notably enhanced goods or services, or processes for creating goods and delivering services, and is extensively sanctioned as being imperative to economic advancement (Blankley & Moses 2009, p. 15). Innovation embraces all the activities culminating in a new thing, buttressing the competitive benefit of an organisation (Van der Meer 2007, p. 192). Executives are mindful that a key metric of their organisation for corporate performance and future success, is innovation (Blankley & Moses 2009, p. 15). Yusuf (2009, p. 1) states that the creative application of knowledge leads to innovation and that innovation comprises two essential elements: knowledge, the rudimentary item and its functionalities and the creative action, being the foundation for the innovation. Amabile *et al.* (1996, pp. 1154-1155) defines innovation 'as the successful implementation of creative ideas within an organisation', while Smith (2009) noted that innovation is a very complex topic that draws on several disciplines and professions.

Creativity refers to the mental process of generating these novel ideas or concepts, approaches or actions that have both originality and appropriateness to some purpose. The innovation process therefore characteristically involves creativity, but also includes successful commercialisation (Puccio *et al.* 2005). Barsh (2008, p. 2) posits that innovation consists of two parallel processes in which new, appropriate ideas or inventions are explored in a creative way and these ideas are aggregated, selected, diffused, implemented and exploited. Innovation, as reflected in Pillar 12 of the GCR, is a crucial driver of economic development, economic accomplishment and economic

review.. It is acknowledged as the critical means to build business sophistication (pillar 11), in order to uphold competitiveness and success in organisations and nations. It is deemed an intangible resource, arduous to emulate, nonetheless it represents a source of competitive advantage. (Hung *et al.* 2010, p. 427).

At organisational level, most innovation is the result of borrowing rather than creating. Organisations use existing knowledge in new contexts and in new combinations. Cohen and Levinthal (1990, p. 129) found that insight is derived from the premise that for organisations to assimilate and use novel knowledge they require prior related knowledge. The premise is further enriched and justified by cognitive and behavioural studies at individual level that found that memory development is self-reinforcing. Associations with prior concepts develop memory as well as enhance learning (associative learning). The association involving former learning and succeeding performance accentuates how important prior knowledge is for learning. Two categories of knowledge are needed to innovate: component knowledge (core design concepts) and system knowledge (configuration of how components are linked and integrated).

Innovation generation is a process resulting in a new outcome to an organisation (Damanpour & Wischnefsky, 2006). Innovation adoption, on the other hand, is a process resulting in the absorption of a new product, process, or practice to the adopting organisation (Damanpour & Wischnefsky 2006; Walker 2008). Innovation is the successful commercialisation of novel ideas and is explained by the equation: innovation equals invention plus exploitation. The invention process involves all the endeavors targeted at inventing novel ideas and operationalizing them. The exploitation process involves all the endeavors of commercial progress, application as well as transfer, and the ensuing broad utilization and distribution of the technologically-grounded outcomes (Roberts 2007). Invention is the most important factor influencing the rate of innovation. Most innovations are applications of preceding inventions. Innovation would be severely restricted if inventing were to cease. Innovation, which represents invention and exploitation or commercializing of the invention, is thus a subset of a much bigger set of inventions, as not all inventions are successful. This is portrayed in Figure 46.

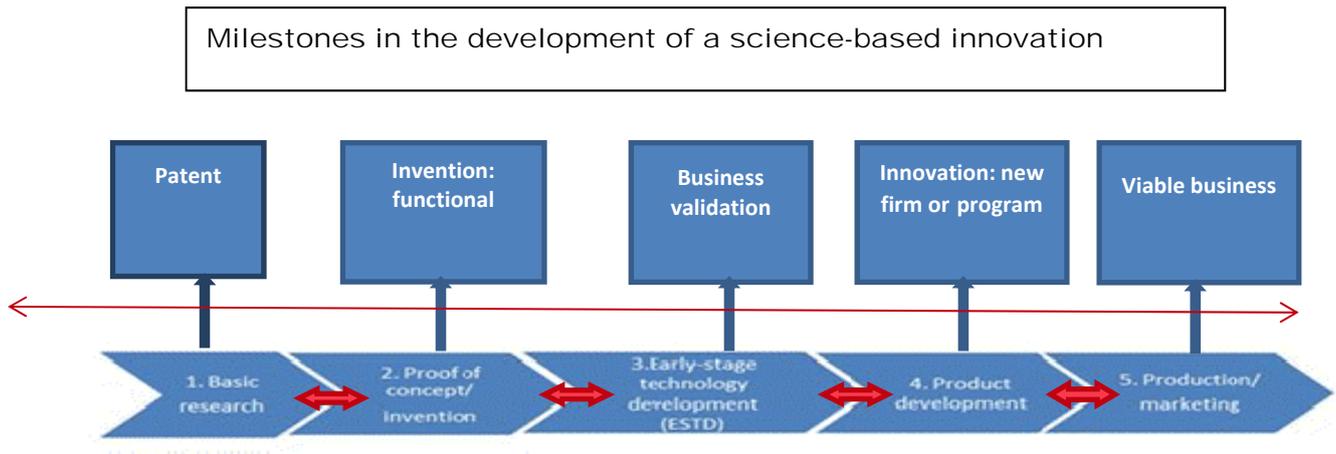


Figure 46: Sequential model of development.

Source: (Adapted from Branscomb & Auerswald 2002, p. 32).

The model of the innovation process defines the stages between invention and innovation. The process is segmented into five stages. The first two lie within prototype development, trailed by proof of concept. The third stage is the invention, initiating the transition. Applicable product stipulations for a recognised market are exhibited, while production procedures are condensed to practice and defined, permitting approximations of product cost. The business case can now be corroborated, and may possibly start to attract sufficient capital for initial production and marketing, the beginning of Stage 4. At the closing stages of Stage 4, the product has been launched in the open market, and an innovation has been created (Branscomb & Auerswald 2002, pp. 31-33).

4.5 INNOVATION EXECUTION GAP

Lepsinger (2006, pp. 56-57) derived from a survey concerning innovation execution gaps that:

- 49% of the leaders surveyed perceived a mismatch concerning their organisations' capability to develop as well as communicate constructive strategies and the organisations' competence to implement them;
- 64% did not have certainty that their organisations are capable of bridging the gap;

- 75% believed their organisations had a clear and inspiring vision (the vision was not the problem); and
- 69% of those that perceived a gap believed the strategies were realistic, and 63% believed they were well-defined and motivating.

The question that arises is: What is contributing to the gap? Successful execution takes more than strategic direction; it needs interpretation of what is necessary to attain the strategy and what priorities need to be actioned. The minority of organisations question whether their management system can support the attainment of the strategy. Organisations need to move further than acquiring insight and approval for the strategy, organisation-wide actions need to be mutually supportive, co-ordinated, and monitored. Leaders need to act consistent with organisational principles and priorities (Yusuf 2009).

82% of Fortune 500 CEOs (<http://www.theotalks.net>) felt their organisations performed effective strategy planning. However, merely 14% signified that their organisations were successful in implementing the strategy. This is referred to as 'the execution gap'. Williams (2011, p. 3) adds to this argument that this gap is the result of the absence of transparency and action concerning the strategic direction of the organisation and its intense attempts to stay solvent, pleasing stakeholders. The author further argues that the main aim of innovation management is to bridge the gap between executive decision-making and strategic direction, on the one hand, and the execution of project-based initiatives and front-line operations of the organisation, on the other. Innovation critical success factors identified by Govindarajan (in Williams 2011, 6) are:

- a convincing argument for innovation;
- a motivating, shared vision of the future;
- an aligned innovation agenda;
- senior managements' observable involvement;
- a model to make decisions that fosters teamwork supporting passionate champions;
- a multi-functional and creatively resourced, devoted team;
- boad-minded investigation of the open market is a driver for innovation;
- readiness for risk-taking; and
- a clear and adaptable execution process.

Failure to innovate is failure to execute, failure to execute is a failure of leadership. If strategy and the execution of that strategy are important, why then does innovation fail to get a foothold in organisations? The innovation execution gap is explained in Figure 47.

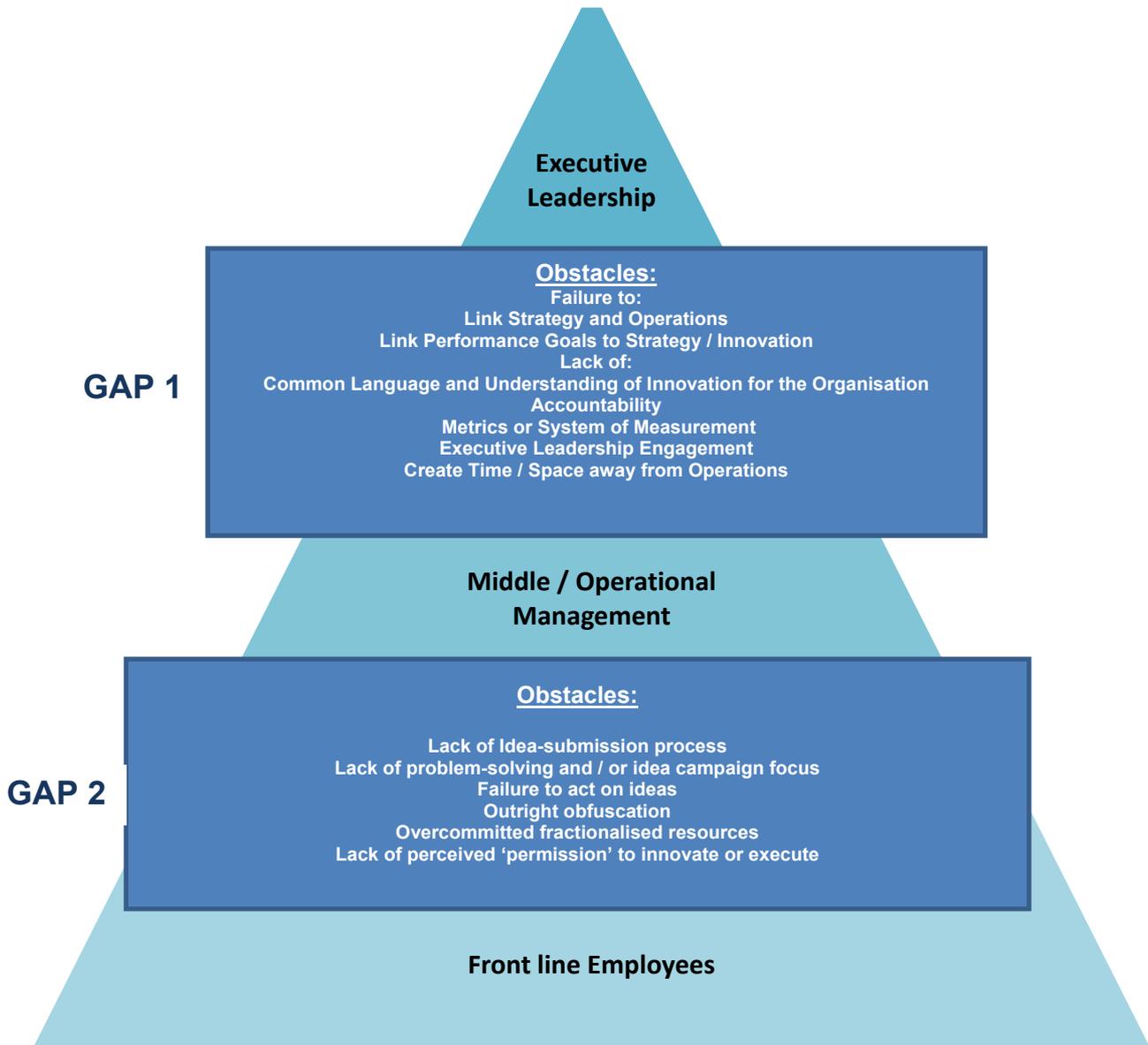


Figure 47: Innovation execution gap.

Source: (Williams 2011, p. 7).

Organisations have a multitude of ideas on their operations through their employees, management and stakeholders. Ideas are the energy part, while innovation requires

action and execution. Williams (2011) found that to bridge the gap between innovation strategy and execution, the following is indispensable:

- ensure innovation management is treated as a true business discipline within the organisation and is provided with appropriate resources and leadership engagement;
- establish a robust, flexible process for managing innovation and for transitioning from concept to action;
- connect executive decision-making and strategy with the front-line operations of the organisation;
- enable an organisational climate where change is managed effectively and ideas to enhance execution are supported; and
- build appropriate organisational structures, including resources that support execution, empowerment and decision-making.

4.6 CLASSIFICATION OF INNOVATION

New-knowledge integration into products, processes and services is signified as innovation. Popadiuk and Choo (2006, pp. 302-306) in this context argues that innovation can be viewed either as a distinct product, outcome or a process of 'introducing something new', with newness being the common thread. The authors frame that newness can be conceptualised through three primary dimensions of innovation:

- how the organisation encounters new products or processes: through generation or adoption;
- the level of analysis: industry or the organisation or a subunit of the organisation (unit of adoption of newness); and
- the nature of the innovation activity: product versus process or administrative versus technical.

According to Utterback and Afuah (1998), innovation can generically be classified according to its technical, market and administrative characteristics. Technical characteristics refer to technologies utilised in the production of products or rendering of services, openly linked to the work activities of the organisation, pursuing a bottom-up assimilation approach. Market characteristics refer to the four 'P's' related to sales

namely what product, at what price, from what place and how is the product promoted to prospective clients. Administrative characteristics refer to social structures pertaining to the organisational structure, administrative processes as well as human resources. These characteristics are linked to the work activities of management, and follow a top-down approach (Gopalakrishnan & Damanpour 1997); Gopalakrishnan & Bierly 2001). Table 65 gives the generic classifications of innovation.

Table 65: Generic classification of innovation.

Technological (Knowledge of components)	Market (Knowledge of marketing-mix)	Administrative (Knowledge of organisational structure & processes)
Product (satisfying market need)	Product	Strategy
Service (satisfying market need)	Price	Structure
Process (introducing elements into organisation's operations)	Place	Systems
	Promotion	People

Source: (Popadiuk & Choo 2006, p. 303).

The discourse about innovation occurring with or without scientific knowledge can be explained as:

- a linear model where scientific and technical sequential processes are steered by experts; scientists develop innovations that are taken up by practitioners (Smith 2000); essential drivers of this model are specialist research and development activities plus scientific knowledge; additional types of knowledge-creating activities are disregarded (Hodgson 2004); or
- processes that emphasise learning; these processes can be grounded in activities which recombine and/or modify prevailing forms of knowledge (Smith 2000); they do not imply the discovery of new technical or scientific principles; alternative knowledge forms such as tacit knowledge and social capital are important.

Organisations that have innovation competency is able to influence products and services to customer requirements by altering employee knowledge and ideas. In the view of Hung *et al.* (2010) such innovations are manifested in creative products, services, technology or administrative practices. Contextual technologists analyse the industry processes as well as the innovation process. Process sociologists analyse innovation sequences at organisational level. Gopalakrishnan and Damanpour (1997, p. 22) add by including the fact that they understand innovation as an incessantly evolving process entailing a number of complex phases; comprising a multitude of activities, decisions, individual behaviours and social systems; focusing on innovation itself, within the organisational context; and understanding innovation thru phases in the adoption process. Such a process view offers the possibility to conduct case studies, analysing less innovations, in more depth. More research is needed to evaluate the impact of process or administration innovations on operational efficiencies, to assess diffusion within organisations (Damanpour & Gopalakrishnan 2001; Pae *et al.* 2002). No generally accepted definition of innovation exists. Criteria utilised to conceptualise innovation in diverse areas are not entirely independent of each other:

- researchers at organisational level match innovation with adoption of a useful idea; and
- researchers at organisational unit level incorporate generation as well as adoption in the definition for innovation.

Differences amongst economists, technologists as well as sociologists, in their conceptualisation of innovation are given in Table 66.

Table 66: Conceptualisation of innovation.

	Stage of process	Level of study	Type of innovation
Economists	Generation	Industry	Product and process
	<ul style="list-style-type: none"> Idea generation 		Only technical
	<ul style="list-style-type: none"> Project definition 		Only radical
Technologists			
Contextual technologists	Generation	Innovation (in the industry context)	Product and process
	<ul style="list-style-type: none"> Commercialisation and marketing 		Only technical Radical and incremental
	<ul style="list-style-type: none"> Diffusion 		
Organisational technologists	Generation	Organisational	Product and process
	<ul style="list-style-type: none"> Idea generation 	Sub-systems	Only technical
	<ul style="list-style-type: none"> Problem-solving adoption 		Radical and incremental
	Adoption		
	<ul style="list-style-type: none"> Initiation 		
Sociologists			
Variance sociologists	Adoption	Organisation	Product and process
	<ul style="list-style-type: none"> Initiation 		Technical and administrative
	<ul style="list-style-type: none"> Implementation 		Radical and incremental
Process sociologists	Adoption	Innovation (at the organisational level)	Product and process
	<ul style="list-style-type: none"> Initiation 		Technical and administrative
	<ul style="list-style-type: none"> Implementation 		Radical and incremental

Source: (Gopalakrishnan & Damanpour 1997, p. 20).

In making coherent sense of innovation, it is necessary to consider a complementary classification scheme that classifies innovation into degrees of innovation. As novelty represents originality, one can discriminate amongst 'the creation of new knowledge' and the 'adoption and use of existing knowledge' (Knell & Srholec 2009, p. 3). The character associated with the innovation process alters with the increasing distance from the technology frontline (Knell & Srholec 2009, p. 1). This emphasises the importance of innovation for organisations in countries trying to leapfrog to the technology forefront, however the character of the innovation will not be comprehended without bearing in mind the degree of novelty (Knell & Srholec 2009, p. 4). The newness of product innovation is associated with competencies, structure, and strategy. Knell and Srholec (2009) further indicated that in frontier countries research and marketing capabilities enhance the result, while in under developed countries process progression and foreign

ownership achieve enhanced transformation. Figure 48 illustrates the different degrees of novelty in innovation.

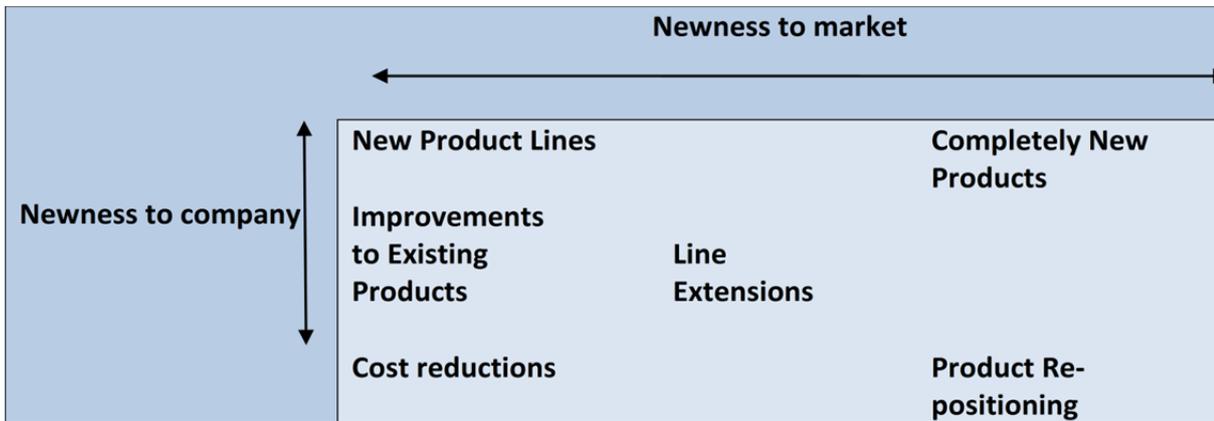


Figure 48: Degrees of novelty in innovation.

Source: (Adapted from Cooper 2001, p. 7).

These degrees of innovation can be further categorised as different types of innovation, depicted in Figure 49. The types covered can be described as radical, architectural, modular or incremental innovation.

		Components/core concepts	
		Reinforced	Overturned
System/ linkages	Unchanged	Incremental Innovation	Modular Innovation
	Changed	Architectural Innovation	Radical innovation

Figure 49: Types of innovations.

Source: (Smith 2010, p. 32).

Figure 49 opposed incremental and radical innovation as two extremes, but also introduced two intermediate types namely architectural and modular. A key feature of modular innovation is the use of the current systems' architecture and configuration, with added new or extensively different components, notably if the new components embrace a new technology (Smith 2006). Architectural innovation is defined in essence by changing the configuration of the system by instituting new linkages. These changes are further illustrated in Table 67.

Table 67: Changes associated with types of innovation.

Innovation	Components	System
Incremental	Improved	No change
Modular	New	No change
Architectural	Improved	New configuration / architecture
Radical	New	New configuration / architecture

Source: (Smith 2010, p. 32).

A clear distinction is made between incremental and radical innovation to determine the level of change related to it. Radical innovation refers to essential change in the organisation and/or industry's behaviour and represents a definite departure from present procedures. In contrast, incremental innovation, delineates a minor variation mainly reinforcing current capabilities of the organisation. The difference between incremental and radical innovation is further elaborated on in Table 68.

Table 68: Differences between radical and incremental innovations.

Focus	Incremental	Radical
Time frame	Short term: 6–24 months	Long term: usually 10 years or more
Development trajectory	Step after step from conception to commercialisation, high levels of certainty.	Discontinuous, iterative, meeting setbacks, high levels of uncertainty.
Idea generation and opportunity recognition	Continuous stream of incremental improvement: critical events largely anticipated.	Ideas often pop up unexpectedly, and from unexpected sources, slack tends to be needed; focus and purpose might change over the course of the development.
Process	Formal, established, generally with stages and gates.	A formal, structured process might hinder.
Business case	A complete business case can be produced at the outset; customer reaction can be anticipated.	The business case evolves throughout the development, and might change; predicting customer reaction is difficult.
Players	Can be assigned to a cross-functional team with clearly assigned and understood roles; skill emphasis is on making things happen.	Skill areas required; key players may come and go; finding the right skills often relies on informal networks; flexibility, persistence and willingness to experiment are required.
Development structure	Typically, a cross-functional team operates within an existing business unit.	Tends to originate in R&D; tends to be driven by the determination of one individual who pursues it wherever he or she is.
Resource and skill requirements	All skills and competencies necessary tend to be within the project team; resource allocation follows a standardised process.	It is difficult to predict skill and competence requirements, additional expertise from outside might be required; informal networks; flexibility is required.
Operating unit involvement	Operating units are involved from the beginning.	Involving operating units too early can again lead to great ideas becoming small.

Source: (Popadiuk & Choo 2006, p. 306).

Another classification scheme considers the regions and behaviours that the innovation touches, namely product versus process (Tiwari, 2008, p. 1). Process innovation depicts the equipment, tactics, and knowledge in new technologies to an industry, organisation, or sub-unit that act as a go-between between inputs and outputs. Such innovation occurs

later in the product life cycle and aids the effective implementation of low-cost strategies. Product innovation represents the introduction of products, or services to the advantage of the customers/clients. Such innovations are more frequent in the initial product life cycle and are aligned with differentiation strategies.

A fourth classification scheme classifies innovation by the kind of knowledge related to the innovation process (Popadiuk & Choo 2006, p. 305). An interpretation of the movement of knowledge and how it is assimilated throughout an organisation is an important capability for improving organisational processes. Knowledge assimilation contributes to organisational competitive advantages (Grant 1996). Sizeable organisations are often deficient in a well-defined twofold structure, where uniformity for incremental innovation is combined with flexibility for radical innovation (Cosier & Hughes 2001; Sharma 1999). The purpose of innovation embraces products and services as well as alterations in the processes, creating as well as delivering these products and services. Edquist (1997) distinguishes innovation by aggregation level:

- individual scale (innovation as improvement);
- functional scale (innovation as process improvement or adaptation);
- company scale as an entire value chain (radical product and service innovation, new business models); and
- industry scale (technology breakthroughs as systems of innovation).

Innovations vary noticeably and require a level of refinement to pinpoint accurately where the innovation rests. This highlights the degree of variation in technology and technological change and overlap. Distributed and open models for innovation are capable of assertively contesting traditionally closed and proprietary models (e.g. open source software communities) (Tuomi 2009). The characteristics of distributed and open models for innovation are summarised as self-nominated involvement; self-structuring and association without any explicit measure of project management; drivers for participation are user needs and the orientation towards fun; governance by freely disclosing knowledge and informing hybrid organisational models, blending community together with commercial models. Lakhani and Panetta (2007) argues that in these distributed communities the motivation for innovation is linked to extrinsic reasons such

as building a reputation and possible future rewards. The concept of having fun links up with an individual understanding of creativity; the hallmark associated with ‘voluntary’ participation and distributed innovation emerges as a challenge, enjoyment and creativity.

‘Open Innovation is a paradigm that assumes that firms can and should use external ideas as well as internal ideas ... as they look to advance their technology’ (Chesbrough 2006, p. 1). It is suggested by Chesbrough’s (2003) research that the resources needed for creating innovation will not be accumulated with those for commercialising them. The research rationalises the reasons why organisations should commercialize external sources of innovation (Chesbrough 2006). Successful commercialisation needs to be aligned with the organisations business model (Zott *et al.* 2011) as well as a different culture (Dodgson *et al.*, 2006; Witseman *et al.*, 2006). Driving forces for external sourcing are improved efficiency and access to innovation-producing capabilities, outside the focal organisation (West and Bogers 2014). A four-phase process model for leveraging external sources of innovation are given in Figure 50.

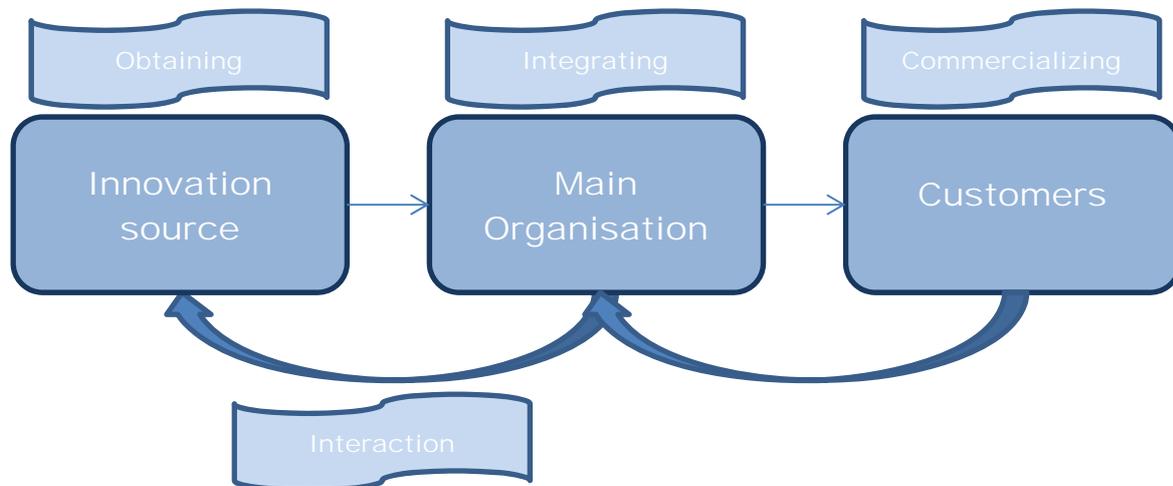


Figure 50: Four-phase Process Model
Source: (West & Bogers 2014, p. 816)

Open innovation ought to be conceptualised as a distributed innovation process involving purposively managed knowledge flows across the organisational boundary. Chesbrough’s definition is also linked to the key types of open innovation (inbound;

outbound; combined coupled type) as well as associated mechanisms (pecuniary and non-pecuniary flows).

Table 69: Conceptualisation of Open Innovation.

A summary of prior research on spillovers and the benefit of being able to utilise them when they exist in surrounding environment, is given.	
Nelson, 1958	Research generated spillovers meant that social return to R&D investment exceeded that of private return to the organisation undertaking the investment.
Cohen & Levinthal, 1990	Researched importance of investing in internal research in order to utilize external technology, an ability termed 'absorptive capacity'.
Rosenberg, 1990	Research enhanced the firms' ability to use external knowledge
Spillovers that were unspecified and unmanageable, can be transformed into inflows and outflows of knowledge that can be purposively managed in the open innovation model. Mechanisms can be designed to direct the inflows and outflows of knowledge	
Inflows: Organisations can develop processes to seek and transfer in external knowledge into their own innovation activities.	
Outflows: Organisations can create channels to move utilised internal knowledge from inside organisation to other organisations in surrounding environment.	
Inflows and Outflows: coupling external knowledge sources and commercialisation activities. Involves inflows and outflows of knowledge to collaboratively (two or more partners) develop and/or commercialise an innovation. Implies mechanisms such as strategic alliances, joint ventures, consortia, networks, ecosystems and platforms.	

Source: (Chesbrough & Bogers 2013, pp. 9 -12).

From Table 69 the definition of open innovation from Chesbrough can be redefined as a 'distributed innovation process based on purposively managed knowledge flows across organisational boundaries, using pecuniary and non-pecuniary mechanisms in line with each organisations' business model' (Chesbrough and West 2014, p. 12).

Divergent views have emerged that build on the distributed nature of innovation sources, which include:

- distributed social division of labour – von Hippel (1988, 2005);
- open source innovation – Raasch, Herstatt, and Balka (2009);
- open collaborative innovation – Baldwin and von Hippel (2011);
- distributed sources of knowledge for innovation – Bogers and West (2012);
- IP management strategy as part of open innovation – Chesbrough and Appleyard (2007); and

- users as an important source of innovation – Baldwin, Hienerth, and von Hippel (2006); Bogers, Afuah, and Bastian (2006); Shah and Tripsas (2007).

(Chesbrough and Bogers 2013, pp. 15 -17).

As innovation works different in different institutional environments, the institutional context is important to the operation of innovation processes and particularly open innovation. (Chesbrough and Bogers 2013, p. 21).

A further categorisation of innovation originates from the notion of application or use of innovation and leads to three types of innovation that are portrayed in Table 70, together with examples of such innovation and their innovators.

Table 70: Forms/types of Innovation.

Form	Innovation	Innovator	Country
Product (tangible)	iPod Ballpoint pen Velcro Computer mouse	Steve Jobs/Apple Laszlo Biro Georges de Mestral Douglas Engelbart	US Hungary Switzerland US
Service (intangible)	Telephone insurance Social networking website World wide Web "No frills" airline	Peter Woods/RBS Mark Zuckerberg Tim Berners-Lee Herb Kellner/R King	UK US UK US
Process (equipment / methods)	Moving assembly line Float glass Hub + spoke delivery system Computerised airline reservations (SABRE)	Henry Ford Alistair Pilkington Fred Smith IBM/American Airlines	US UK US US

Source: (Smith 2009, p. 29).

Organisations in South African lag behind their equals in regions for instance EU, USA and East Asia in relation to successful outcomes from innovation management processes (Oerlemans & Pretorius 2006, p. 4). This might be related to the industrial composition of SA as well as the low R&D. Progressive economies are largely built on services signifying a major enlightened knowledge economy. The results of a study on the emerging picture of how SA organisations manage their innovation, are reflected in Table 71.

Table 71: Emerging picture of how South African companies manage their innovation.

Innovation is a source of competitive advantage with the focus on: <ul style="list-style-type: none"> • Product innovation (60.5%); • Business model innovation (57.9%).
Outcomes in these industries (General business (33.3%); finance (31.4%); government and parastatals (16.6%)) are process or incremental orientated in nature and are difficult to measure.
Focus more on incremental innovation (50%) than radical innovation.
In most instances there is a combination of focus areas.
Organisations are not focusing on one type of innovation at the expense of another.
The development of an innovation strategy is seen as critical to innovation (85.4%).
49.9% of polled organisations have an innovation strategy.
Creativity and lateral thinking are viewed as both a critical and a standard requirement for innovation success.
Project management software and project implementation (59%); general innovation training (56.1%) and resource planning (55%) also need to be in place in support of innovation.
Innovation activity takes place predominantly in an ad-hoc manner.
Reward and recognition mechanisms are not addressed adequately (38.8% actively reward innovation efforts)
26.8% actively measure innovation outcomes.
Summary: <ul style="list-style-type: none"> • innovation remains prized but is not managed or driven adequately; • innovation management needs to emphasise the softer issues around employees; • innovation needs to be part of the organisation's strategy to be effective; • people feel like lone rangers and need the backing of the organisation.
Results: <ul style="list-style-type: none"> • strategic intelligence for innovation is not yet in place; • innovation takes place in ad-hoc manner; • reward and recognition are not addressed; • innovation value is not sufficiently demonstrated; • there is no relationship between spending on innovation and superior financial returns; • organisations with a deliberate innovation process achieved 40% higher growth in operating income as a result.

Source: (Poll on Innovation in SA 2012).

Given the results in Table 71 there has been remarkable product innovation in SA. Some of these innovations are highlighted in Table 72.

Table 72: Product Innovation in South Africa.

<p>CAT scan: In the early 1960s, Cormack showed how details of a flat section of soft tissues could be calculated from measurements of the attenuation of X-rays passing through it from many different angles. He thus provided the mathematical technique for the CAT scan, in which an X-ray source and electronic detectors are rotated about the body and the resulting data is analysed by a computer to produce a sharp map of the tissues within a cross-section of the body.</p>	<p>Tufts University in the UK by South African physicist Allan Cormack and Godfrey Hounsfield of EMI Laboratories. 1979 Nobel Prize in Physiology or Medicine.</p>
<p>Oil from coal Sasol is the world's first – and largest – oil-from-coal refinery. It is situated in Sasolburg in SA and provides 40% of the country's fuel.</p>	<p>Major milestones include the first automotive fuel (1955), the construction of the National Petroleum Refiners of SA (1967) and the establishment in 1990 of its first international marketing company, Sasol Chemicals Europe.</p>
<p>Heart transplant In November 1967, Schrire called Barnard and told him that there was a suitable patient for a heart transplant. Louis Washkansky was suffering from heart failure and was prepared to take the chance.</p>	<p>The world's first heart transplant was performed by Dr Chris Barnard in Cape Town on 3 December 1967.</p>
<p>Speed gun The South African-made speed gun, developed by Somerset West inventor Henri Johnson, was formally launched at The Oval in England during the 1999 Cricket World Cup.</p>	<p>The device accurately measures the speed and angles of speeding objects such as cricket and tennis balls.</p>
<p>Kreepy Krauly A machine that would clean a swimming pool automatically, efficiently powered by the ordinary operation of the pool's filter.</p>	<p>The swimming pool vacuum cleaner was invented by Ferdinand Chauvier, a hydraulics engineer who came to SA from the Belgian Congo in 1951.</p>
<p>APS therapy Lubbe aimed to electronically stimulate the body's natural nerve impulses to relieve pain (arthritic pain) Then he set out to invent a device that would alleviate the problem.</p>	<p>After building the first prototypes and obtaining approval from the health department and the Food and Drug Administration in the United States, Lubbe formed the company Tech Pulse in 1993 to produce, market and distribute the Action Potential Stimulation device.</p>
<p>Pratley Putty Pratley's famous glue is the only South African invention that has been to the moon. In 1969 the putty was used to hold bits of the Apollo XI mission's Eagle landing craft together.</p>	<p>Krugersdorp engineer George Pratley invented his famous sticky stuff in the 1960s while looking for a glue that would hold components in an electrical box.</p>
<p>Dolosse Dolosse are large, unusually shaped concrete blocks weighing up to 20 tons. The structures are designed to break up wave action and protect harbour walls and coastal installations.</p>	<p>Designed by Eric Merrifield and first installed in East London harbour, they are now used all over the world.</p>

Source: (Bruton 2010, p.46)

Briefly, innovation is the mechanism for change. Defying change is dangerous. Organisations are not able to shield themselves from change, notwithstanding their superiority or the limitlessness of their current resources (Koornhof 2001, p. 21). Change, effects uncertainty and risk, and produces opportunity. As Buckler (1997, p. 45) implies, innovation 'is an environment, a culture – almost spiritual force – that exists in a

company' and leads to the creation of value. It extends across all the actions needed to deliver customer value coupled with an acceptable return for the organisation.

4.7 THEORIES ON INNOVATION

An open question is what exactly drives innovation in organisations and economies. It can be debated that it is the result of the verbalization of consumer requirement or industrial supply; and that innovation happens by linking many stakeholders from developers to intermediary organizations, through an intricate compendium of processes. Yakhlef (2005) postulates that contextual transformations progressively displaced the starting point of innovation from the R&D unit, with tacit knowledge as the principal resource of innovation, to a scattered network of all stakeholders through information technologies. Innovation is slowly migrating from an organisations' locus of control in the direction of external loci where tacit knowledge is located. Thomke and Von Hippel (2002) add, knowledge relating to product development is difficult to encapsulate as customers own customer needs and the manufacturer owns the knowledge on how to satisfy those needs. Radical and revolutionary innovations have a tendency to emerge from R&D, whereas incremental innovation may emerge from practice (Yakhlef 2005).

Current organisational theory research has highlighted opposing paradigms, presenting organisations' management of their innovation and arrangement of their (R&D) activities. These paradigms are:

- intensified centralisation is aimed at the arrangement of the R&D unit (Harris & Ghauri 2000);
- the R&D unit is progressively more flexible and crumbled, devolved, adaptable and non-hierarchical or commissioned out to many associates as well as clients (Whittington 1990; Thomke & Von Hippel 2002; Chesbrough 2007); and
- that organisations are devolving their innovation-related tasks to various market players, speeding up innovation processes and bridging the gap between producers and consumers (Quinn 2000; Sawhney *et al.* 2003).

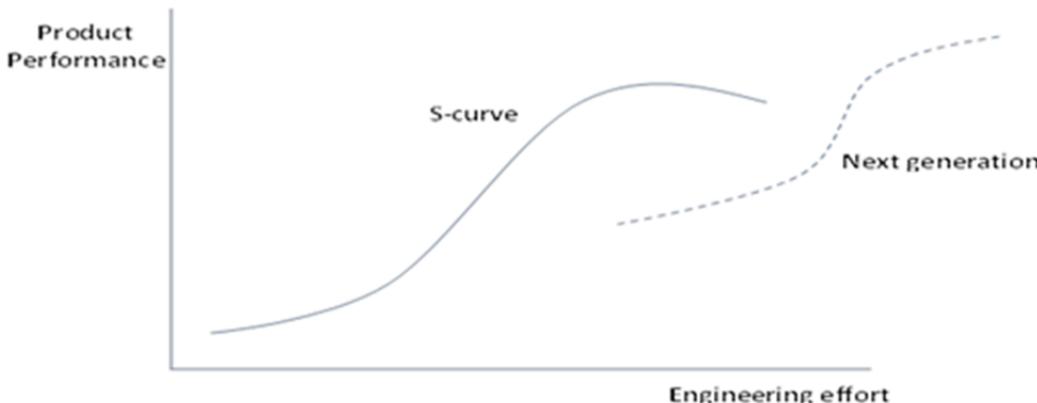
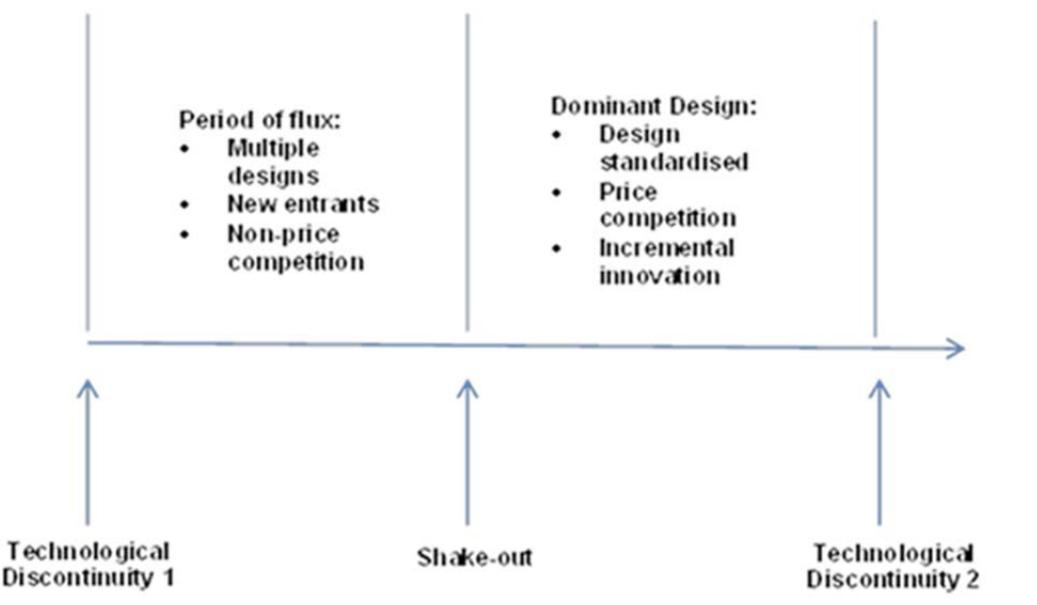
Yakhlef (2005, pp. 227-239) reports that the 'Open Source' model links many people from distinct communities in a combined endeavour to develop open software. Such

moderately unrestricted boundaries of the community make entry and exit effortless, in so doing forming a self-motivated and shifting community. The authors further explains that Open Source moves innovation from the hierarchical, restricted model to the non-hierarchical, unrestricted approach.

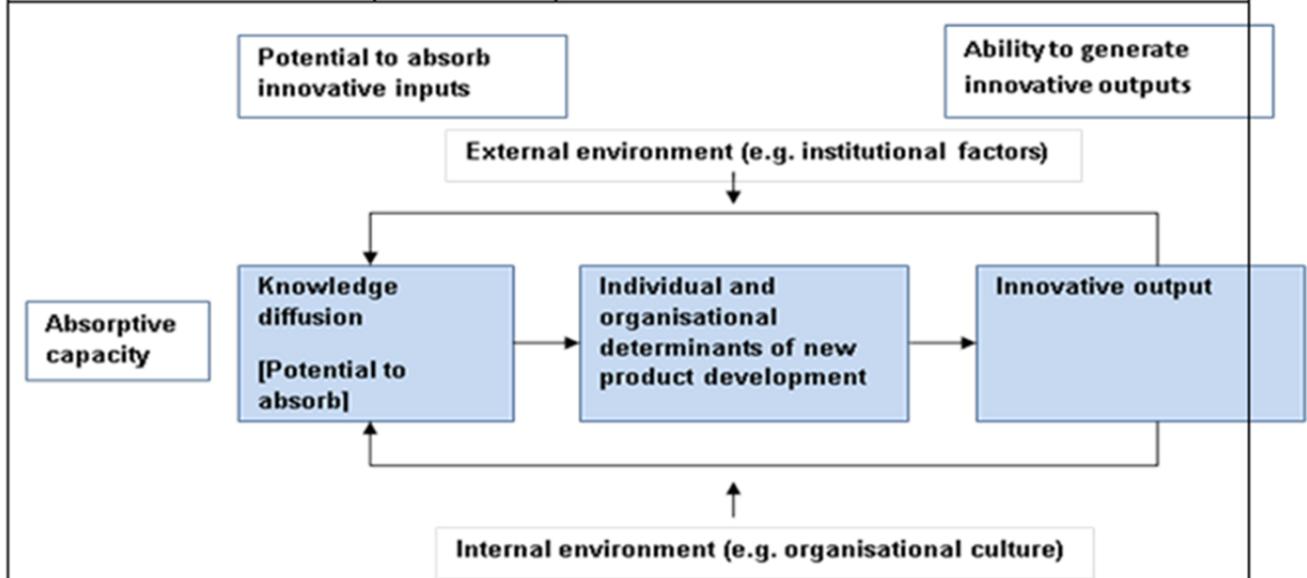
Governments push innovation to resolve economic and social problems including productivity in addition to the rate of unemployment. These efforts are not at all times successful (EU Commission, 1995) as business change is persistent while innovation needs to incessantly recharge an areas' economy. Innovation is a major socio-economic driver for economic welfare growth over a period of time (Porter 1990) while Sundbo (1998) theorises that important innovations are the motivation for global economic cycles ('Kondratiev waves'). The drivers of innovation are intensified global competition and customer needs, reduced product life cycles as well as developments in technology.

Innovation needs to be grounded in a body of knowledge that can assist in its analysis and justification, to promote a better understanding of, in particular, features such as complexity, populism and interest in its success and failure. This could lead to a better understanding of a range of activities, including the collective effort of innovation as well as organisational support for innovation success (Smith 2006, pp. 65-67). Theories provide scope for analysing innovation. The different innovation theories, linked to the specific time when they were dominant, are summarised in Table 73.

Table 73: Innovation theories.

Theory	Timeframe	Description
Technology S-curve	1986	This theory looks at the notion of a technology life cycle and implies that over time the capability of a technology to deliver improved performance will vary and that it will eventually reach some kind of 'natural limit' as it matures.
 <p style="text-align: center;">Technology S-Curve (Smith, 2006:67)</p>		
Punctual equilibrium	1978	This is an evolutionary theory, placing technology as a central force shaping the pattern of innovation. Distinguishes between incremental and radical innovation to demonstrate how established industries go through periods of stability with changes confined to incremental innovations. Eventually the stability is disrupted by radical innovation that is highly disruptive, bringing the period of equilibrium to an end.
Dominant design	1982	Design or product configuration that wins the loyalty of the marketplace and is linked to ideas about the evolutionary development of science. Dominant designs arise from consumer preference (not all technical), market power of dominant producer or regulation.
 <p style="text-align: center;">Dominant Design and the Technology Cycle (Smith, 2006:74)</p>		

Absorptive capacity	1990	Theory integrates both external dimension of innovation (evolution of technology) and the internal dimension (learning and knowledge transfer process). The emphasis on learning distinguishes it as providing a different analytical framework from the S-curve or the punctuated equilibrium. It is concerned with 'the ability of a organisation to recognise the value of new, external information, assimilate it and apply it to commercial ends' (Cohen & Levinthal, 1990:128)
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Source: Smith (2009:78)

Functional Integration Innovation Process Theory		Industries involve the different functions of the organisation that are possible for the New Product Design and Development (NPDD) process in a parallel, instead of a sequential mode. Core feature is functional integration.
Systems integration and Networking Innovation Process Theory		This process involves new electronic tools such as simulation. Elements <ul style="list-style-type: none"> • Time-based strategy • Developments focus on quality and other non-price factors • Emphasis on corporate flexibility and responsiveness • Customer focus at the forefront of strategy • Strategic integration with primary suppliers • Strategies for horizontal technological collaboration • Electronic data processing strategies • Policy of total quality control
Systems of Innovation Theory	1990s	Theory relates the policy of innovation players to the ability of organisations to innovate, which in turn affects the wealth of a nation (Sundbo, 1998). Tries to identify the social and economic effects of the process that creates innovation and the actors that affect the process across a nation.

Source: (Compiled from Galanakis 2006, pp. 1222-1224).

4.8 SOURCES OF INNOVATION

Innovation is generally unstructured and cannot easily be portrayed linearly. Innovation has transformed from a linear model to a non-linear and more complex relationship-

based model. Innovation is no longer a process of fixed linear sequence of phases but is the result of numerous actions of many players. (Mbananga 2007).

To pinpoint the exact idea-generation moment or moment of insight is difficult, and therefore an understanding of the diverse sources of innovation is important. Figure 51 depicts insights and sources of innovation.

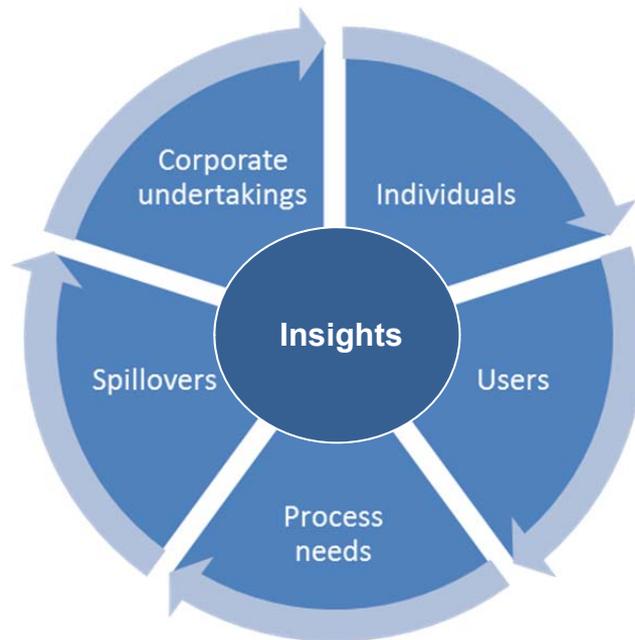


Figure 51: Insights and sources of innovation.

Source: (Smith 2006, p. 86).

Kenny & Reedy (2007, pp. 131-132) found in an investigation into the impact of organisational culture factors on innovation levels, that the top internal and external sources of innovative ideas were identified as management, the managing director, and customers. The top nine important sources of innovation, ranked from highest to lowest importance, were identified as:

- customers;
- customers' customers;
- networking;
- universities and colleges;
- technology transfer;

- suppliers (strategic fore sighting);
- internet;
- trade associations; and
- internal company resources.

Zahra and Covin (1994) note that corporate undertakings to acquire innovation can be either through imitation, acquisition, or incubation. They are explained as:

- imitation – an organisation copies innovations presented by other organisations, either in its own population or in other organisational populations;
- acquisition – an organisation acquires innovations developed by other organisations by way of acquisition, licensing, or merging; and
- incubation – an organisation develops its own innovations, or by way of a joint venture.

The difference between these sources of innovation is of the essence, as it decides the time and attention allocation, in addition to the rate and adoption speed. Once a selected source is merged with an appropriate structural arrangement, the efficacy of the selected source is enhanced (Damanpour *et al.* 1998, p. 5).

4.9 BARRIERS TO INNOVATION

A study from the Austrian Institute of Economic Research by Hölzl and Janger (2012) confirmed the relevance of differentiating barriers between innovation-hampering (innovation firms) and deterring (non-innovative firms) (D'Este *et al.* 2012). Table 74 gives the external and internal barriers that were identified in the study.

Table 74: External and internal barriers.

Levels of analysis in the firm	Deterring / hampering barriers
<ul style="list-style-type: none"> Internal (Interest to policy makers in understanding how organisations innovate and how internal barriers affect innovation potential) 	<ul style="list-style-type: none"> Adoption barriers related to dominant designs, path dependency and successful products – increased by bureaucracy Mind-set barrier is inability to unlearn – associated with lack of distinctive competencies Risk barriers associated with excessive reliance on routines and experience and unwillingness to cannibalise own products Nascent barriers associated with management incapability to foster thinking outside the box and manage the innovation process <p>(Assink, 2006) Barriers can also be considered as organisational screening devices</p>
<ul style="list-style-type: none"> External (Evidence on external barriers to innovation provides rationale for policy intervention) 	<ul style="list-style-type: none"> Lack of availability of finance for innovative activities Lack of technological knowledge or market opportunities for innovation Lack of connectivity in the innovation system that impedes innovation collaboration Unavailability of skilled labour related to organisational and market context of economy and associated with market, government and system failures

Source: (Hózl & Janger 2012, pp. 3-4).

In the same study (Hózl & Janger 2012, p. 22), the factors affecting the perception of innovation barriers were identified as organisation size, organisation growth, international and national linkages of firm activities, and sectorial innovation intensities. The results from the study indicate how innovation activities might be shaped by institutional and economic differences.

Loewe and Dominiquini (2006, pp. 24-28) report that an ‘innovation diagnostic’ can review opportunities in the pipeline and marketplace results and compare them with practices of leading innovators, rather than blindly copying best practices. In acting systematically, all four of the following underlying and interrelated root causes can be addressed:

- leadership and organisation;
- process and instruments;
- people and skills – numbers (many employees) and diversity (creativity and imagination being randomly distributed) lead to cross-functional effort; and
- culture and values.

Keys to a systemic innovation capability is graphically explained in Figure 52.

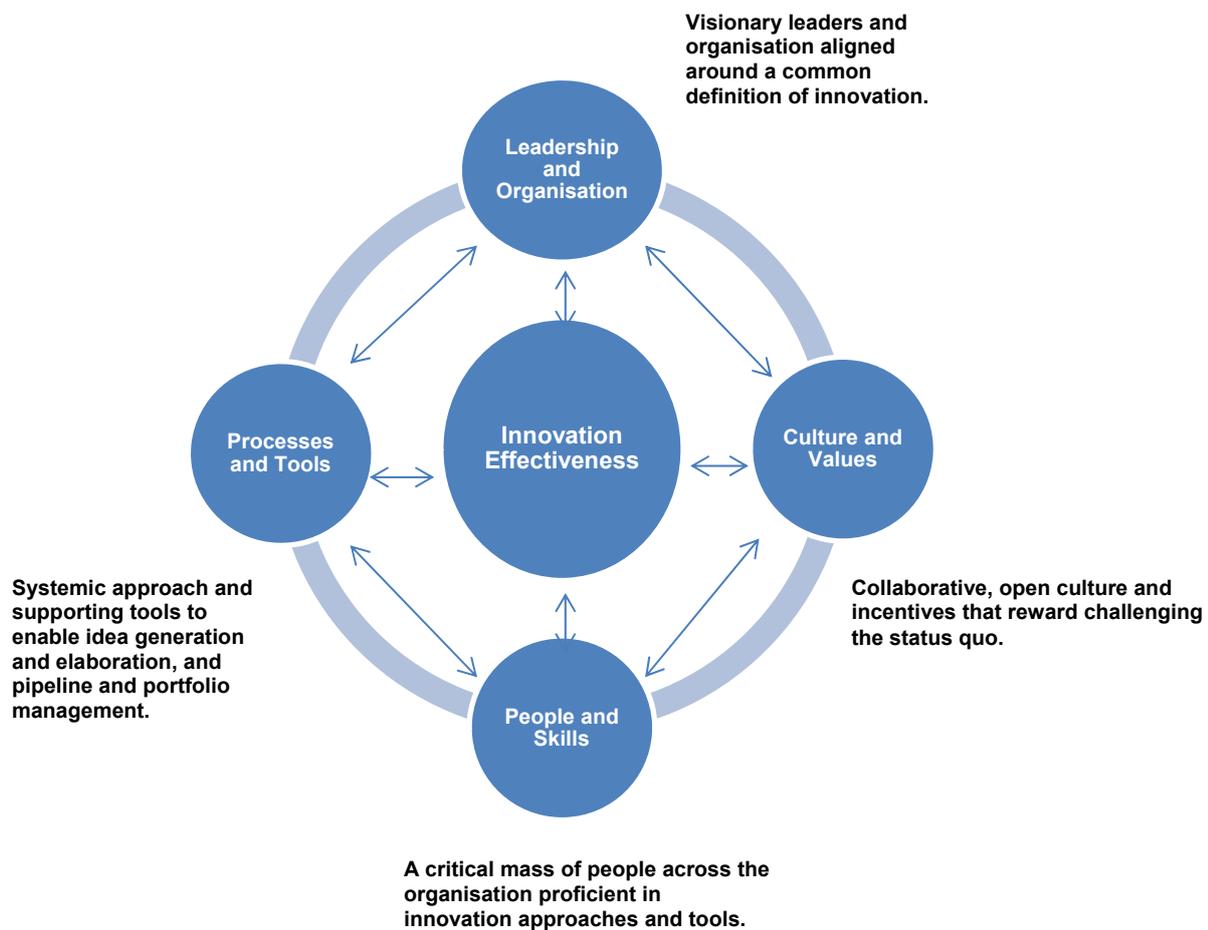


Figure 52: Keys to a systemic innovation capability.

Source: (Loewe & Dominiquini 2006, p. 25).

The next section will explore the innovation process as the gaps between the different phases hold the greatest hurdles.

4.10 INNOVATION PROCESS

Innovation is the decisive organisation and focussed use of organisational abilities and knowledge (Pitt & Clarke 1999, p. 301). The innovation process has different phases and the greatest hurdles of the process are in the spaces between the different phases, affected by the people involved and their attitudes. The first phase is to generate or create timely ideas by capturing, aggregating, and acknowledging. Ideas arise as 'wow' moments or as a consequence of the determined hunt for opportunities (Drucker 1985;

Stoyko *et al.*, in Lazic 2007, pp. 24-25). Preserving innovative ideas together with related information in an accessible central and common location preventing reinvention and allows reintroduction of ideas because of changed circumstances (Dinsdale *et al.* 2002; Cooper *et al.* 2002).

The primary practised technique to search for opportunities is by way of regular stakeholder interaction, including customers, by means of interviews, spending time together in the work environment and working together with innovative customers (Cooper *et al.* 2002). Congruence is maintained between organisations' goals and strategies, customers and stakeholders' expectations along with desires. For public service organisations networking with other entities is an effective approach to identify innovation opportunities. Balance is needed between an 'outside in' learning style (a focus on external stakeholders) and an 'inside out' approach (a focus on own employees) as an unremitting source of creativity (TBS 1999). Drucker argued that opportunities for innovation are found either within the company, triggered by unanticipated happenings, inconsistencies, process needs, industry and market challenges; or outside of the company through demographic changes, and new knowledge.

The second phase evaluates and selects ideas by using qualitative, quantitative or judgemental assessment (Cooper *et al.* 2002). The third phase develops and implements ideas, manage risk, culture and politics in the institution. Transformation of ideas to a useful outcome as either a product, service or business model happens. This is not a random process, and a good innovation project manager is crucial to ensuring that the transition from an idea to an innovation occurs effortlessly. An effective system of 'ideas to launch' is needed to make sure the innovation process is successful. Wisdom (2013, p. 2) refer to the Stage-Gate model which is utilised to generate, evaluate and launch ideas by following continuous improvement principles, providing a systemic, well-organized methodology to risk management, project evaluation and decision making. On an organisational/systems level the innovation adoption process is complex.

The last phase is to diffuse and to socialise innovation, whose success is decided by the absorption capacity of the market (Christensen & Raynor 2003). A deliberate, flexible and

well-planned innovation dissemination plan accounts for a fluctuating universe, in addition to advancing social and personal wants and biases (Worren, Moore & Elliott 2002). The initial phase in such a procedure is creating mindfulness of innovation through suitable communication. After that customers' needs and preferences need to be understood.

The diverse activities undertaken in the procedure of commercialising an invention is portrayed in the innovation process. It needs to be stressed that organisations embark on innovation in varied and distinct ways. Figure 53 depicts a generic innovation process.

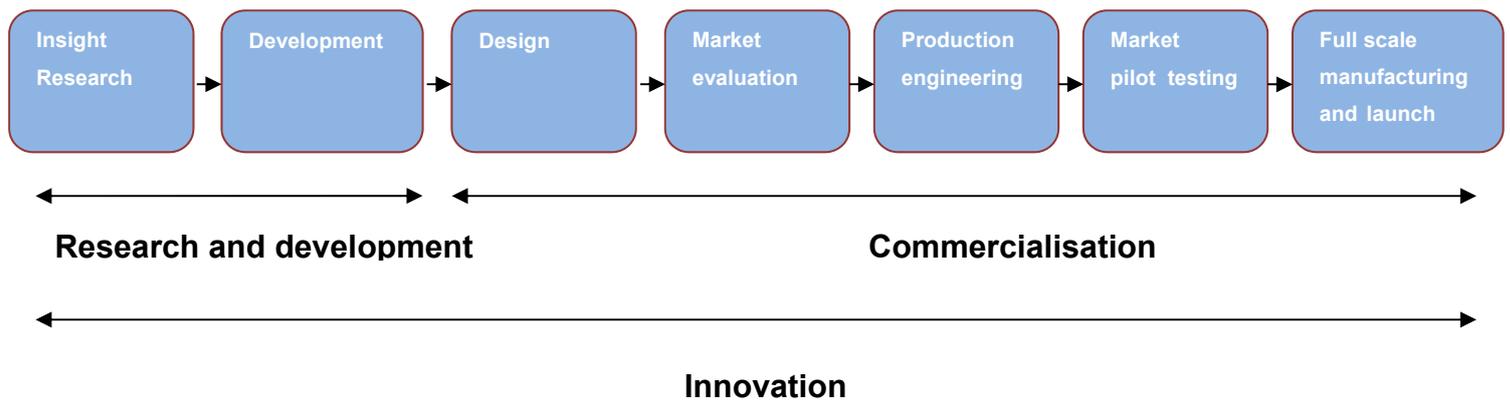


Figure 53: A generic-model of the innovation process.

Source: (Smith 2010, p. 105).

Although the generic model identifies different activities, it neglects to show all the different available methods to innovation and does not take account of newer models of innovation as summarised in Table 75.

Table 75: Models of the innovation process.

Model		Description
1. Technology process	push	Scientific and technological advances push a new product into the market.
Source: Smith (2006, 119)		
2. Market (demand) process	pull	Market needs to pull a new product into the market.
Source: Smith (2006, 120)		
3. Coupling process	innovation	Sequential process but not necessarily continuous. Process can be divided into a series of interdependent stages and feedback to the previous stage.

Source: (Smith 2010, p. 120).

Inherent challenges to the process of innovation are addressed in the techniques and approaches that surround each phase. Adams (2005) motivates that finding points of common interest in the institution will unite employees and mobilise their support to innovate. The intersection between disciplines or cultures creates the best chance to innovate because so many unusual ideas are generated by diverse employees. Exposure to more than one culture shatters barriers because an intricate association exists between domain specific expertise and the ability to think outside that domain's established paradigm. An inhibitor of creativity is how our minds create order in a chaotic world by clustering associations around a concept. If these associative barriers are low they make unusual connections leading to successful creativity and the intersection of ideas ultimately leads to innovation. (Adams 2005, pp. 34-35).

4.11 ADOPTION OF INNOVATION

Thompson and Purdy (2009, p. 203) found that successful innovation adoption is positively related to agreement about innovation congruence. Innovation adoption increases the significance of some values and beliefs over others, through changes in resources, practices, and relationships (Thompson & Purdy 2009, p. 203). Once adopted, the innovation becomes part of the organisation's practices and culture. Innovation represents 'a collective achievement of pushing and riding ideas into good currency' (Van de Ven, in Thompson & Purdy 2009, p. 591), and this leads to the conclusion that faculty composition is a critical contextual variable affecting the innovation process (Thompson & Purdy 2009, p. 204), influenced by relative value of hard and soft skills stemming from professional ideologies and norms.

The degree to which the innovation is incorporated into the organisation and its contribution to organisational behaviour and performance, constitutes success. There are two main stages to the adoption process :

- Initiation consisting of -
 - innovation awareness;
 - attitude towards the innovation; and
 - evaluation of the innovation from an organisational perspective;

- implementation consisting of -
 - pilot implementation to determine its suitability to organisational needs; and
 - sustained implementation to assimilate it into the organisation.

(http://www.spreadingscience.com/pdfs/3_five_steps.pdf).

Sustained competitive advantage for organisations is embedded in their ability to plug into ideas and knowledge and draw on these linkages to learn, accumulate expert competencies and to innovate. Knowledge sources are dispersed across different players and player groupings and have led to a state of affairs that is described by Rothaermel (in Herstad & Bloch 2008, p. 9) as one where 'knowledge is generated through the repeated combination and re-configuration of diverse disciplines and expertise in flexible forms of organisation'. Industrial knowledge is hardly ever discipline based, but rather synthetic knowledge bases that are fed by generic to highly specialised inputs, also blending sectorial systems. The more complex these bases become the more dependent they become on several origins of information, ideas plus knowledge (Herstad & Bloch 2008, pp. 7-9).

A study by Lakhani and Panetta (2007) mentions the 'Law' of the co-founder of Sun Microsystems, Bill Joys, which emphasises that enterprises are confronted with the difficulty that in any sphere of activity, significant knowledge resides outside the limits of any one organisation, and that the key challenge for the ones in control of the innovation mission, is to discover approaches to access such knowledge. The explosion of knowledge makes it difficult for most companies to stay competitive by identifying and securing key sources of knowledge to complement momentous trends. The conventional closed models of proprietary innovation experience great difficulty in finishing tasks that are knowledge intensive, because most of the knowledge is situated in knowledge sources outside of the organisation.

In 1945 Hayek argued that knowledge is unevenly distributed in society and that centralised models for economic planning and coordination are prone to failure due to an inability to aggregate this distributed knowledge. This phenomenon is further complicated by the suggestions of Von Hippel (1975) that 'users' dominant role in originating

innovation reflects the fact that knowledge is not only distributed but also 'sticky', that is, relatively difficult and extremely costly to move between locations, thus shifting the locus of innovation to where it is the stickiest.

Organisations secure and use sources of knowledge and technology outside the organisation to increase their innovation capability thereby enabling competitiveness. It is necessary for organisations to develop competencies by means of external sources to know how and what to learn. External collaboration is complementary to replacing any dynamic and iterative in-house research activities and is encouraged by the snowballing complexity of the research and development process as well as the cost and risk of such processes. The penetrability of the firms' border is a strategic choice and not merely a function of the nature of the firm's knowledge assets (Fey & Birkinshaw 2005, pp. 5-6). Other factors influencing external collaboration are:

- relative appeal of external sources of expertise;
- the want to increase in-house activities;
- enabling in-house staff to participate with the research community, by way of networking with other organisations;
- governmental policies; and
- incentives to participate in collaborative research.

Innovation adoption is complex; encouraging change in routine procedures when change is not perceived, as required by management, is very challenging (Garland *et al.*, in Wisdom *et al.* 2013). The decision of individuals to adopt innovation in organisations was found to be complicated by organisational factors that were not subjected to individual problem-solving (Aarons *et al.*, in Wisdom *et al.* 2013). The key constructs associated with the adoption process have been identified in a narrative synthesis approach by Wisdom *et al.* (2013) and are given in Table 76. The research by Wisdom struggled with the inevitable disagreement between and inconsistency of definitions and measurement of constructs, as is reflected in the literature.

Table 76: Models of the innovation process.

Constructs	Pre-adoption	Adoption
1. Socio-political and external influence		
<ul style="list-style-type: none"> External environment 		Urbanisation Competitive environment
<ul style="list-style-type: none"> Governance policy and regulation 	<ul style="list-style-type: none"> Enactment and implementation of policies, legislation or regulation 	<ul style="list-style-type: none"> Legislation and policies of regulatory agencies, accreditation standards include innovation Political and cultural fit
<ul style="list-style-type: none"> Reinforcing regulation with financial incentives 	<ul style="list-style-type: none"> Policies and incentives 	
<ul style="list-style-type: none"> Social network 	<ul style="list-style-type: none"> Social networks, linkages and cultural groups 	<ul style="list-style-type: none"> Social networks and network externalities
2. Organisational characteristics		
<ul style="list-style-type: none"> Absorptive capacity 	<ul style="list-style-type: none"> Organisation's absorptive capacity Organisation's use of existing knowledge and skills base 	<ul style="list-style-type: none"> Organisation's ability to identify, capture, interpret, share, reframe, recodify new knowledge to link it with existing knowledge
<ul style="list-style-type: none"> Leadership and champion of innovation 	<ul style="list-style-type: none"> Top management support Leadership promotion 	<ul style="list-style-type: none"> CEO's influence, champions, opinion leaders Leadership promotion Organisational support for innovation Prior experience in innovation adoption, skills, years since completion of training / education
<ul style="list-style-type: none"> Network with innovation developers and consultants 	<ul style="list-style-type: none"> Bi-directional collaboration, networking and personal contacts with outside consultants 	
<ul style="list-style-type: none"> Norms, values and cultures 	<ul style="list-style-type: none"> Shared values and client centredness 	<ul style="list-style-type: none"> Shared values Problem-solving norms
<ul style="list-style-type: none"> Organisational size and structure 	<ul style="list-style-type: none"> Availability and mobilisation of organisational resources committed to innovation Formalised and centralised structure Larger size and greater differentiation in personnel and structure Lack of agency formal research infrastructure 	<ul style="list-style-type: none"> Availability of organisational resources committed to innovation Size and structure Formalised and centralised decision-making structure Lack of agency formal research infrastructure Organisations with foci of professional knowledge
<ul style="list-style-type: none"> Social climate 	<ul style="list-style-type: none"> Positive social climate and social learning Social pressure 	<ul style="list-style-type: none"> Adoption decision at individual / group level Social factors
<ul style="list-style-type: none"> Social network (inter-organisations) 	<ul style="list-style-type: none"> Inter-organisational networks 	<ul style="list-style-type: none"> Interconnectedness and multiple inter-organisational networks
<ul style="list-style-type: none"> Training readiness and efforts 	<ul style="list-style-type: none"> Organisational and management support Building in methods for maintaining staff competence and performance over time 	<ul style="list-style-type: none"> Innovations that are incorporated into training / education curricula Targeting / communication about innovation
<ul style="list-style-type: none"> Traits and readiness for change 	<ul style="list-style-type: none"> Receptive context and readiness for change 	<ul style="list-style-type: none"> Innovativeness Readiness for change Risk reduction
3. Innovation characteristics		
<ul style="list-style-type: none"> Complexity, relative advantage and observability 		<ul style="list-style-type: none"> Innovations that are clarified as to what they are and what their implementation might entail Innovations that are perceived as simple to use Innovations that have a clear, unambiguous advantage in effectiveness over preceding idea, product or programme Innovativeness that requires less expertise Innovations with benefits that are visible to intended adopters Knowledge required to use the

Source: (Wisdom *et al.* 2013, pp. 6-8).

4.12 CONCLUSION

This chapter pointed out that organisations confront important environmental intricacy in the current global economy. These complexities include the criticality of flexibility and speed acting in response to customers and markets (Davis *et al.* 1999), operational competence to reduce costs, conservational matters, managing diverse employees that every so often lack dedication, and the improvement of beneficial working relationships with stakeholder groups (Waddock 2001). Creativity, innovation, and change have been advocated as a solution to these challenges, whether developing a learning organisation (Kline & Saunders 1993; Senge 1990), an innovative organisation (Kelley 2001) or simply a creative organisation (Robinson & Stern 1997). The multiphases and multidimensionality of innovation adoption was discussed and how it is influenced by factors within several dimensions.

The following chapter will convey the factors that influence innovation adoption.

CHAPTER 5: LITERATURE REVIEW - FACTORS INFLUENCING INNOVATION ADOPTION

5.1 INTRODUCTION

Globalisation, a process of indeterminate change, sets everything it touches in motion and heightens the contest for concepts, abilities, and knowledge, causative to economic benefit. The peak in evolutionary progress is typified by the shift from 'bloody wars' to 'knowledge wars'. Material forces use to be central in national development, status, and power, but these have been replaced by inventions of the mind. Rosecrance (2014, pp. 202-203) posits the possible relocation to far off places of most of a nation's material production encourages a nation to be more attentive to R&D and the design of products. This results in a novel and beneficial association between designing nations and manufacturing nations. The author also mentions that organisations are not only faced with competition for access to resources, but also with cost and quality challenges and the competition for customer loyalty. Tyrer (2009, p. 15) contributes to debate by stating that channel- and product complexity, necessitates that organisations create, calibrate, channel, and partner strategies, through scientific means, to accommodate highly dynamic business environments.

Economic globalisation selectively creates new jobs, and changes relationships between education, jobs, and rewards. The world has entered a global knowledge economy where barriers are disintegrating in favour of international trade and investment. This global knowledge economy is characterised by knowledge-intensive industries, driven by the application of new technologies, thereby increasing labour market flexibility. Wong and Chin (2007, p. 1290) report that to gratify customer expectations, organisations need to provide products and services perceived to be valuable measuring them against performance indicators of organisational innovation. The authors continue by stating that the notion of globalisation has its own domain and an international perspective from which change can be comprehended.

Organisations are pressured to function in multiple time regions, prospecting for new opportunities while also analysing current situations. Organisations are also expected to be extensive in their reach, small in size, operative, and efficient (Gavetti & Levinthal 2000; Miles *et al.* 1978). High-ranking employees need to be progressive and backward-thinking, while they maintain equilibrium between exploratory and exploitative actions. Exploiting promotes inactivity, as well as conservatism, and crushes exploration (Benner & Tushman 2002). Exploration effects productivity, but too much exploration can prevent learning by doing or achieving economies of scale (He & Wong 2004). In order for organisations to successfully compete, they need to simultaneously be flexible and focused, while also learning and unlearning (Bunderson & Sutcliffe 2002). Short-term efficiency in addition to long-term innovation holds the key to sustained performance. Novel 'organisational practices' are key to the mentioned contradictions, as they hold the potential to produce innovative advances in functioning (e.g., Laursen & Foss 2003), efficiency (e.g., Datta *et al.* 2005), and profitability (Mendelson 2000). The full realisation of potential benefit is dependent on organisations introducing a set of organisational practices that are mutually reinforcing.

As discussed in chapter 4, innovation is applied creativity, therefore, seeking to be innovative requires that the principles of creativity are continuously kept in mind. Khandwalla (2006, p. 1) identified the major internal impediments to organisational innovativeness as: inflexible administration, bureaucratic and conventional structures and cultures, and ineffective communication. Teece (2010, p. 172) on the other hand emphasised that, as a result of new communication and information technology and the founding of open global trading regimes, the choice of clientele has increased. Differentiated needs are expressed by this clientele, while the provision of alternatives have become more transparent. Reduced cost of information provision and solutions to customers, have been made possible as a result of the progress in technology. Organisations must reconsider the value propositions they offer their customers. The required mind-set change in the stakeholders of organisations, with conservative cultures operating in protected economies, can be intimidating. Innovation changes the *status quo* even more when the impact is broad and/or deep. The political nature of innovation implies that the innovators need to have the skills to influencing others, in order to

neutralise opposition (through persuasion) and build support for the innovation, to make it commercially successful.

This chapter discusses managing the paradoxes that influence innovation adoption, paying attention to leadership and management practises at a strategic level. These leadership outcomes are discussed in terms of '*how to*' stimulate innovation adoption through pertinent factors, such as the:

- structural level — the systematic use of innovation mechanisms, by discussing business models and processes; and
- creating of an innovative climate leading to employee engagement, by discussing organisational culture and climate. An institutional framework, where cultural norms such as creativity and innovation are accepted, is created by organisations and leaders (van der Meer 2007, p. 193).

Human resource factors, cognitive and emotional intelligence, social capital, and person–innovation fit are discussed as factors in the organisation's internal environment that impacts on innovation adoption.

5.2 STRATEGIC LEVEL: LEADERSHIP AND MANAGEMENT PRACTISES

Globalisation compels leaders and managers to acknowledge the context of innovation (Leavy & Sterling 2010, p. 5) as the most important source leading to productive growth and increased material welfare (Edquist 1997, p. 1). Radically different industrial landscapes need organisations to mobilise themselves through innovation, to sustain competitiveness while ensuring future organisational potential (Krause 2004). The process of innovation relating to the organisational level does not happen in a vacuum, but acts in response to shaping, empowering, and constraining factors. Reflecting on the organisation's innovation process, a general view relates to the impact of both an internal (e.g., systems, procedures, and culture) and an external environment (macro- and meso/market forces). As novel solutions to prevailing and surfacing challenges are shaped, specialised and diverse knowledge is absorbed from both these environments. Identification, selection, and immersion of novel ideas with productive potential are facilitated by the interfaces between these two environments (Caraca *et al.* 2009, p. 864).

The route and direction organisations follow, as well as the speed of learning and innovation in organisations, are influenced by:

- the qualities of knowledge, which include complexity, cumulativeness, and appropriateness;
- technology, entailing technical support, movement of labour, licences, and turn-key factories; and
- absorptive capacity variances.

(Cohen & Levinthal 1990; Breschi *et al.* 2000; Nelson & Winter 1982, in Morrison 2007, p. 6).

The innovation process is divided into stages, and is characterised by a number of management paradoxes (van der Meer 2007, p. 194). In the concept stage, a climate that encourages innovation needs to be created by management. In the development stage, the applicable empowering mechanism to nurture projects needs to be established by management, and, in the business stage, management needs to follow an approach of planning, action, and control. To manage innovation is akin to managing paradoxes, as the innovation process entails management responsibilities in all three stages, even when tasks mutually conflict.

Managing paradoxes around uncertainty is given as an example Figure 77:

Table 77: Management paradoxes.

Managing paradoxes around uncertainty	
Uncertainty is:	<ul style="list-style-type: none"> • <i>Beneficial to an innovative climate</i> • <i>Incompatible with the planning required during the business stage</i> • <i>Incompatible with any partnering mechanisms during the development stage</i>

Source: (Van der Meer 2007, p. 194).

The challenge to organisations is to also pay attention to altering the character of management within organisations by adapting organisational structures, processes, and practices in a manner that some foundation for competitive advantage is created.

Birkinshaw *et al.* (2008, p. 829) comment in reporting that innovation in management is ‘the generation and implementation of management practice, process, structure, or technique that is the state of the art and is intended to further organisational goals’, and can potentially benefit both the organisation and the industry by distributing new ideas. Hamel (2006) argues that innovation speaks to the types of change that are encompassing and complex and concerns what managers do and how they do it. It links to variances in how people are motivated and how their behaviours are co-ordinated. Birkinshaw *et al.* (2008) continue by adding that innovation in management is potentially complex and ambiguous, as it transpires without a dedicated infrastructure, and is relatively abstract and intangible.

Innovation in management entails change in three facets: practices (on a day-to-day basis), processes (routines that govern managers’ work), and structures (how organisations organise communication and tie together effort). The role of leadership pertinent to innovation in management could introduce and push changes in these areas (Birkinshaw *et al.* 2008). The ‘critical role of human agency’ is highlighted through the quest for innovations at management level, linked to the activities of strategic persons in the organisation. Innovations in management are inclusive of novel changes in problem solving, decision-making, or implementation procedures, and lead to the improvement of one or more functions (Khandwalla 2006, 4). These range widely, from innovative missions, styles of management, growth strategies, serviceable management, and organisational structures, to flexible working hours, decision-making including staff, and total quality management (Kimberly 1981). Management innovations are difficult to evaluate in terms of profit and loss, and, on occasion, are difficult to implement and institutionalise, because of resistance and fear (Khandwalla 2006, p. 3). Khandwalla (2006) highlighted that innovations by management necessitate some ‘political’ abilities in their benefactors, as the psychological costs can be high.

Leaders influence organisational conditions leading to innovation in management. The leaders’ role is influential in formulating the organisational context favourable for experimenting with novel processes, practices, and structures. Organisational outcomes such as performance and choice, and management innovation, are affected by leaders.

Changes could seem ambiguous, and leaders are there to assist staff to interpret changes and provide direction and assistance, while also stimulating innovative thinking (Zhou & George 2003). The impact of leadership behaviour can be:

- decreased by organisational size; organisational size plays a moderating role that encapsulates the extent of operations, differentiations, and intensified bureaucratic intricacy. Small organisations are less complex, and benefit can be derived from transactional leadership in accomplishing innovation in management while the complexities of larger organisations are offset by transformational leaders (Vaccaro, Jansen, Van den Bosch & Volberda 2012, p. 28);
- decreased as a result of intricate organisational contexts and increased spatial separation (Koene *et al.* 2002); and
- increased through bureaucratic formalisation, as it counteracts the influence of direct leadership behaviour (Koene *et al.* 2002).

The efficacy of leadership is influenced by contextual conditions. These conditions include the phase of organisational growth, the homogeneity of the top management team, the organisational climate, and the mode of governance. Leadership may be helpful in making sense of unclear types of innovation with unclear goals and outcomes, such as the development of new products through technical innovation. Managers and leaders can facilitate the establishment of a milieu in support of the creation and bartering of dissimilar ideas, which is fundamental to creating a climate for creativity. To enable innovation, management needs to set up a climate to stimulate the right combination of debate and conflict (exchange) (Isaksen & Ekvall 2010, pp. 75, 85). Two factorially independent and inversely correlated types of tension, debate, and conflict, exist within climate, depicted in Figure 54.

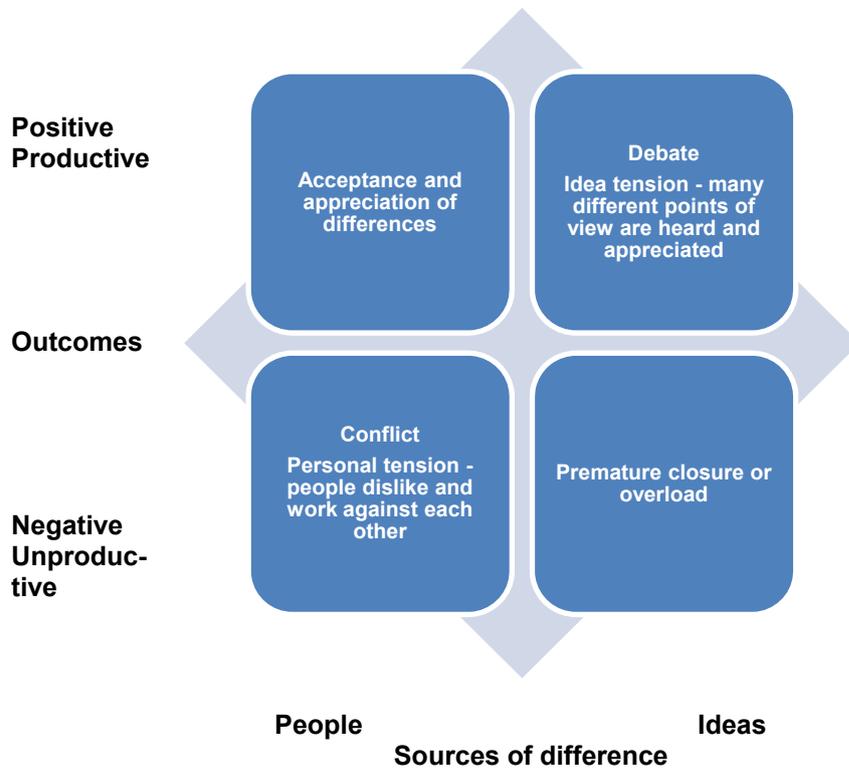


Figure 54: Debate and conflict — forms of tension.

Source: (Isaksen & Ekvall 2010, p. 75, p. 82).

Makri and Scandura (2010, p. 76) report that innovation necessitates an external focus that leads to skilful external communication, enlarging the organisation’s invention prospects by gaining external knowledge. The balance between creative and operational leadership needs to be managed, as there is a close synergistic benefit between creativity and operational leadership. The consequence of the interaction between operational and creative leadership and the quantity of innovation is graphically portrayed in Figure 55.

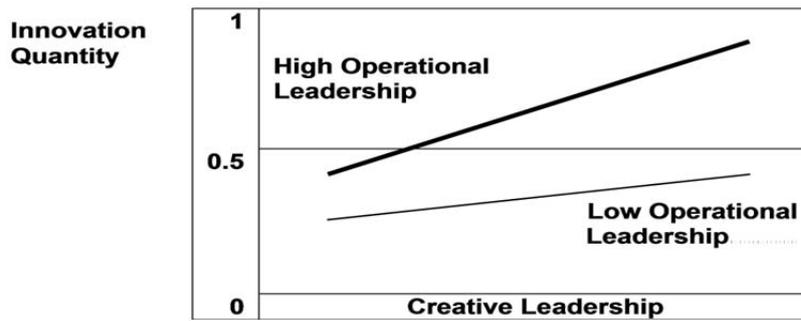


Figure 55: Interaction effects of operational and creative leadership and innovation quantity.

Source: (Makri & Scandura 2010, p. 83).

From Figure 55, the following deductions can be made:

- when operational and creative leadership is high, the highest degree of innovation quantity is attained;
- when operational leadership is high, innovation is greater at all levels, regardless of the level of creative leadership; operational leadership is closely associated with innovation productivity; and
- operational leadership is abstracted as the strategic leadership's competence to progress concepts from generation to development. This will be mirrored in the quantity of innovation.

Organisations consider innovation adoption as their response to environmental forces (Kearney, Feldman & Scavo 2000; Moon & de Leon 2001), as well as organisational characteristics (Damanpour & Schneider 2006; Rivera Streib & Willoughby 2000). Leaders can enable or disable innovation by performing a decisive function in the organisational innovation process by influencing the ecosystem (e.g., culture and climate), as well as creativity within the organisation (Wang & Casimir 2007, p. 229). Strategically, leaders need to clearly define an explicit innovation strategy to guide and focus the organisation's innovation efforts and enable the accurate allocation of scarce resources to critical strategic areas.

An example of the influence of the behaviour of management on future organisational performance, as well as cultures, is found in a study that compared Toyota and Hyundai (Shim *et al.* 2012, p. 581). Toyota has a symmetric leadership and organisational culture, and vies strategically as well as managerially. Planning and work systems are accentuated to lessen the impact of any turbulence in the external environment (stability is key). Hyundai has an asymmetric leadership and organisational culture, and vies by accepting environmental ambiguity and risk as daily occurrences (flexibility is key). These differences allow Hyundai to change course quicker than its bigger competitor when new opportunities and technologies emerge. These approaches are displayed in Figure 56.



Figure 56: Toyota and Hyundai: leadership and organizational culture.

Source: (Shim *et al.* 2012, p. 588).

As is seen in Figure 56, an effective strategic innovation plan is needed to focus the organisation's efforts in the search for innovation opportunities. The innovation strategy and the overall business strategy need to be linked, with the aim of yielding the greatest benefit, while also building on the organisations' strengths. Such a blueprint provides direction in relation to individuals' functions and responsibilities, and in targeting the organisations' endeavours, allowing a clear sense of communal purpose. This focused approach ensures that the organisation's desired role in respective innovation areas, is determined as different focus areas requiring different roles. It further guarantees that resources and time are applied to strategically relevant improvements. The stages in the innovation process are linked to the management tasks, as is portrayed in Figure 57.

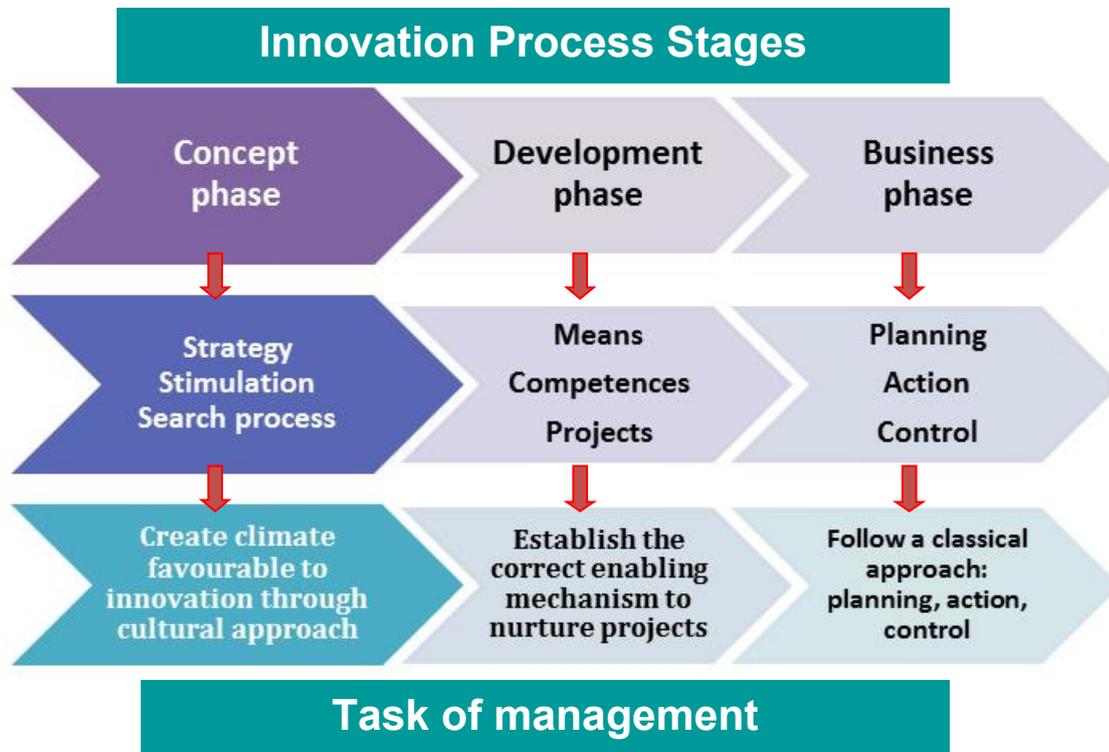


Figure 57: Stages in the innovation process.

Source: (Van der Meer 2007, p. 194).

Leadership is a strong predictor of the realisation of innovative ideas and management of organisational innovation (Lee & Chang 2006). Innovation leadership entails strategically leading the components of innovation while simultaneously forming an integrated overview of innovation. It is the process of leading the organisations' innovation portfolio strategically, not the management of innovative product development projects (Ailin & Lindgren 2008, p. 89). In a study of manufacturing organisations, Noruzy *et al.* (2013, p. 1073) reviewed both the role of transformational leadership and the use of organisational learning and knowledge management in facilitating organisational innovation leading to improved organisational performance. The authors developed a model highlighting how organisational learning and knowledge management are directly affected by transformational leadership, and how transformational leadership through these two constructs indirectly and definitely influences organisational innovation and performance. Organisational learning, in turn, directly and positively influences knowledge management. Organisational innovation is affected (directly) by organisational learning

and knowledge management, while organisational performance is affected (directly) by organisational innovation and organisational learning (Noruzy *et al.* 2013, p. 1073).

Organisational performance and the role of transformational leadership is depicted in Figure 58.

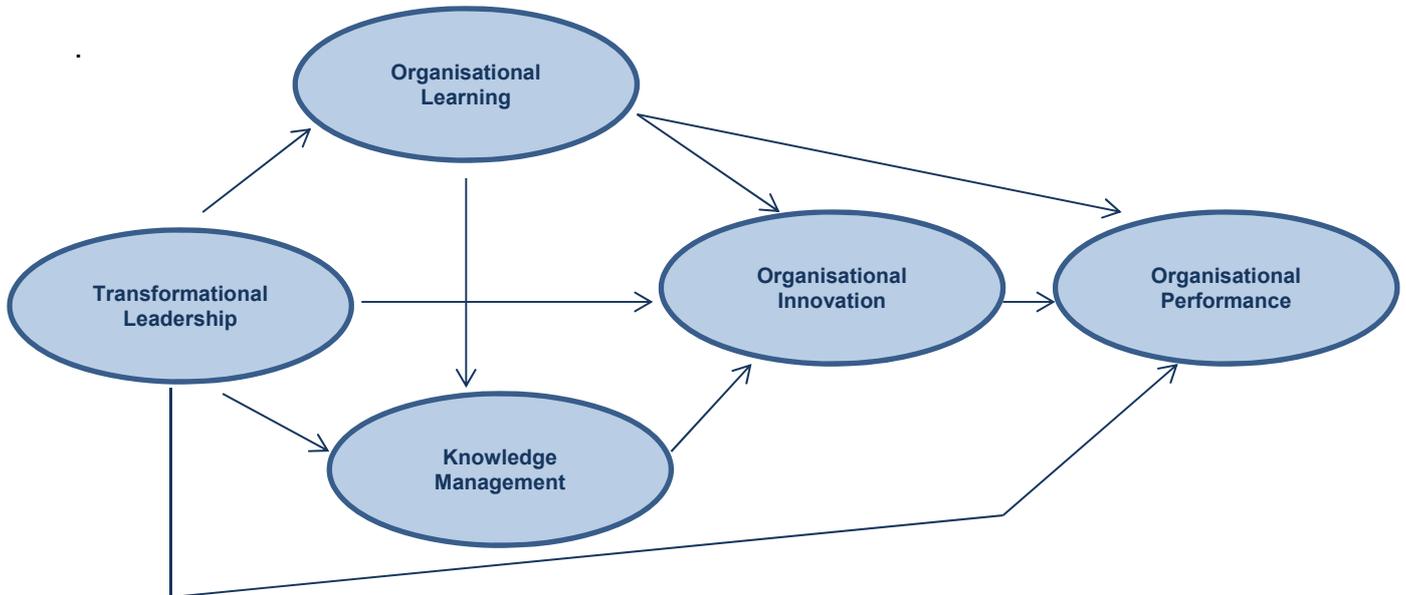


Figure 58: Organisational performance and the role of transformational leadership.

Source: (Noruzy *et al.* 2013, p. 1075).

Transformational leadership amplifies awareness of shared interest among the members of an organisation, and assists them to achieve joint goals (García-Morales *et al.* 2012). Transactional leadership concentrates on serving the leaders' and their supporters' personal interests by achieving the contractual obligations of both (Bass & Avolio 2000). Transactional and transformational leadership are used to different degrees (Bass 1999). A study by García-Morales *et al.* (2012) showed that important and definite relationships are present in organisational performance, innovation, and learning.

Transformational leadership emphasises leadership that encourages creativity in employees, in addition to feelings and principles (Bass & Avolio 2000; García *et al.* 2012, pp. i-ii). Such leadership promotes the professional development of employees by

creating emotional relations with them and inspiring higher standards. This leadership communicates the significance of a shared purpose, direction, and meaning by enhancing staff members' dedication to organisational results (Bass & Avolio 2000). Transformational leaders are charming while providing motivation and promoting intellectual inspiration (Bass & Avolio 2000; García-Morales *et. al.* 2012, p. 1040).

Transformational leadership is evidenced by revered influence, motivation that inspires, intellectual inducement, and individual respect, and is directed at adherents' identification through its intention and shared objectives. The influence of transformational leadership is signified by the degree to which leaders are admired, trusted, and respected. It is also a factor in the advancement of novel managerial processes and practices, together with organisational structures, as is depicted in Table 78.

Table 78: Transformational leadership influences.

Factor	Influence	Influence on
Transformational leadership	Directly influenced	Organisational learning and knowledge management
Organisational learning	Directly and positively influenced	Knowledge management
Transformational leadership	Positively influenced	Organisational innovation and organisational performance
Organisational learning and knowledge management	Directly influenced	Organisational innovation
Organisational learning and organisational innovation	Directly influenced	Organisational performance
Transformational leadership	Positively and indirectly influenced	Organisational innovation through organisational learning and knowledge management
Knowledge management and organisational learning	Effected	Organisational performance indirectly by organisational innovation

Source: (García-Morales *et al.* 2012, p. 1040)

Individual R&D team members have reported higher ratings of transformational leadership, associated with higher ratings of attempts to be innovative. However, transformational leadership is criticised for contextual and situational influences not being contemplated. Transactional leadership, on the other hand, is affected by attaining

compliance from subordinates by agreeing on rewards, as well as the circumstances that ensure the realisation of selected obligations. Table 79 explains transformational versus transactional leadership.

Table 79: Transformational versus transactional Leadership.

Transformational leadership	Transactional leadership
Role models for innovation	Closely related to reinforcement and refinement of institutional learning
Exhibit creative behaviour	Contingent reward is the clarification and specification of what is expected of organisation members and assessment of goals and subsequent reward for its accomplishment
Deliver intellectual stimulation	Active management by exception is leaders active involvement and intervention to monitor and rectify any divergence from an agreed standard
Inspire followers to think differently	
Challenge followers to question existing hypotheses along with working methods	

Source: (Bass 1999, pp. 9-10).

Transformational leaderships' interaction with employee–leader identification, as well as an innovative climate, is correlated with employee creativity (Wang & Rode 2008, p. 1121), as shown in Figure 59.

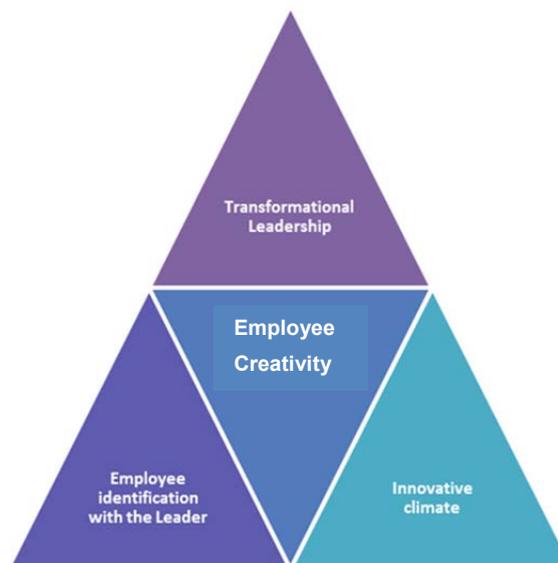


Figure 59: Transformational leadership: interaction between employee-leader identification and innovative climate.

Source : (Own compilation from literature).

Intrinsic motivation, a key element of creativity (Amabile 1988; Oldham & Cummings 1996) that facilitates innovation (Mohamed 2002), should be enhanced through transformational leadership (Shamir *et al.* 1993) that provides appropriate encouragement and support. Shin and Zhou (2003) argued that the behaviour of transformational leadership (charisma, intellectual stimulation, individualised consideration, and inspirational motivation) relates to positive organisational behaviour outcomes (Barbuto & Burbach 2006, p. 52). Transformational leaders provide staff with heightened sensations of personal capabilities, discretion, and responsibility, all related to intrinsic motivation (Zhou & Oldham 2001; Wang & Rode 2008, pp. 1108-1109). Organisational change brought about by way of higher performance necessitates leaders to completely engage and connect with their followers. By enabling self-determination, leaders intensify the emotional impact of supporters' thoughts about and attention to tasks (Barbuto & Burbach 2006, p. 53).

Original and useful creative ideas solve problems, and are a critical resource for organisational success. The creativity of teams, the initialisation for innovation, is encouraged by emotionally intelligent leaders (Rego *et al.* 2007, p. 250). Organisations need to induce and exploit their employees' creative potential in order to survive and prosper. Such potential could contribute positively to change, innovation, learning, competitiveness, as well as performance (Mc Adam & Keogh 2004). Modern organisations face an incongruity between control and predictability, and creativity and change, resulting in tension (Zhou & George 2003). Engagement in creativity inescapably creates tension, conflict, and emotionally charged discussions as well as differences. The emotional intelligence of leaders becomes crucial when these tensions need to be managed and employees be guided to take advantage of them. Employees' creativity can be promoted when leaders interact with them, as well as when leaders create a climate that supports creativity. Creativity can also be nurtured by leaders when they:

- comprehend their own emotions;
- are shielded against criticism;
- are intrinsically motivated (vital for creativity) and persistent, and are allowed to take risks;

- are self-encouraged;
- control their emotions;
- are empathetic; and
- understand others' emotions.

(Rego *et al.* 2007, pp. 252-253).

The 2010 Global IBM CEO interview study surveyed 1 541 CEOs, managers, and leaders from 60 countries, within 33 industries. Initial results revealed the following.

- increased complexity, allowed organisations who had gained a financial advantage (over the last five years), to be successful;
- successful organisations endorse and employ experimentation and innovation throughout their organisations. Creativity is the principal leadership attribute that makes deeper business model changes in order to achieve strategies; more calculated risks and innovation in how they lead and communicate are included. Creativity and integrity, honesty, and global thinking, represents a shift in the way effective leadership is viewed today;
- customer intimacy is imperative for winning organisations, as organisations and customers jointly produce products and services, while customers are also integrated into core processes; and
- winning organisations manage complexity in the best interests of their organisations.

(Global IBM CEO Study 2010).

Leaders initiate change before the need for change arises, by challenging the status quo. If there is no need for change, there is no need for leadership. Chaos and uncertainty are market opportunities, and successful leaders can resolve contradictions and decode conflicts and tensions into exhilaration, commitment, and improved execution. Innovation is enhanced or hindered by leaders. From the Global IBM CEO study and the ratings given to leadership characteristics, it is evident that creativity, the catalyst for change, has been elevated to the most important leadership characteristic, above the other rated leadership characteristics. 'Traditional approaches to managing organisations need fresh ideas, ideas that are intended to disrupt the status quo' (Global IBM CEO Study 2010).

The results of the study are given in Figure 60.

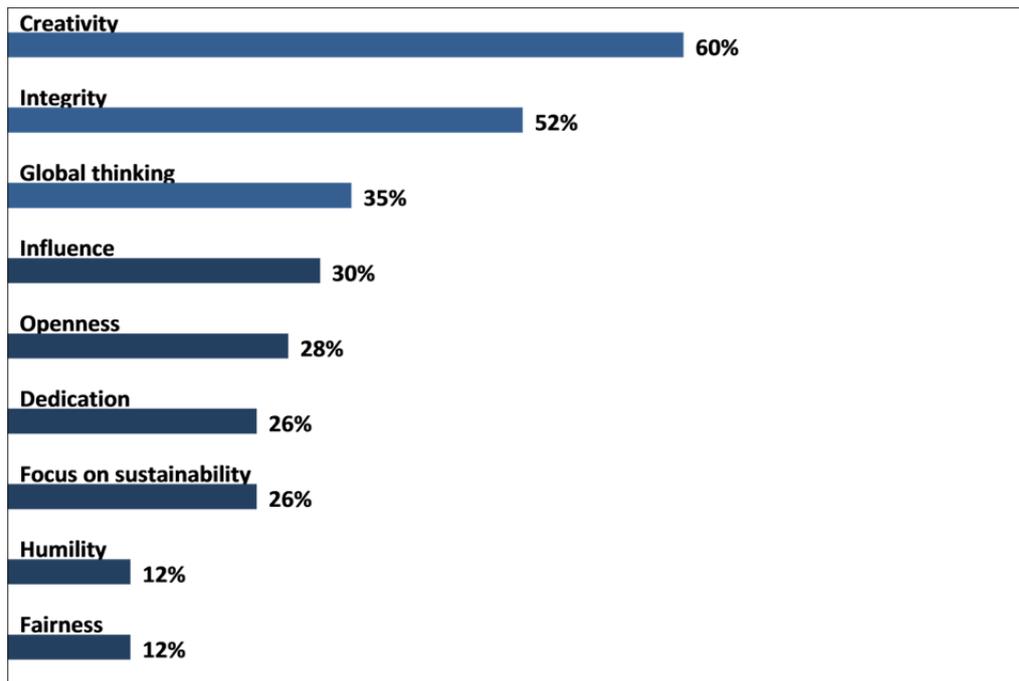


Figure 60: Ranking of the practice of leadership characteristics.

Source: (Global IBM CEO Study 2010).

In the last decade managerial focus shifted from the traditional factors of production to knowledge processing. Leading creative organisations and teams, necessitates that leaders require an entrepreneurial stance as well as managerial skills, routines and approaches to enable good performance from the team. Acting as a creative entrepreneur a leader can design as well as initiate the development and maintenance of an organisations' creative capabilities. (Napier & Nilsson 2006, p. 269). Creative leadership is a growing imperative as creativity breeds innovation and require leaders to upset the status quo, as they must become catalysts for creativity and this requires a new set of capabilities (Meredith 2010, p. 119).

The innovation value chain involves idea generation (mostly people-centred as well as internally-focused), development and commercialisation. It is therefore evident that successful leaders can concurrently investigate and exploit, as well as lead creatively and

operationally. The innovation value chain leads to quantity, excellence as well as newness in innovation. Operational leadership performs a boundary-spanning role by detecting novel market needs as well as developing novel concepts for products and services. This necessitates that they increase the organisations' knowledge diversity by expanding into novel products/markets through different means such as mergers, alliances or acquisitions. Creative leaders are inclined to have an internal organisational focus by fostering human and social capital in addition to producing a supportive milieu (Mumford *et al.* 2002). These leaders concentrate on enlarging the organisation's current internal intellectual reserves and stimulate creative staff intellectually by having faith in them, bolstering them coupled with providing them leeway. They encourage individual initiative while also encouraging the assimilation of team accomplishments (Mumford *et al.* 2002).

The relation between innovation and management is far from being straightforward. Management cannot decide to innovate simply by taking certain actions. Its influence is indirect and dependent on uncontrollable factors such as extraordinary individuals, the results of free interaction between employees (in a space without purposive relations), or the creations of the market. (Spoelstra 2010). By rethinking the basic principles of management:

- Managers become enablers moving away from controllers. Work becomes knowledge work and managers become leaders, recognising performance and remunerate fairly;
- Managerial co-ordination switches from command-and-control to dynamic linking defined as work being done in short cycles where management sets priorities but the decisions about work is the responsibility of those doing the work;
- Values practised moves from shareholder value to values relevant to all stakeholders. The business is grown by generating innovation and customer delight. Two values differentiate the reinvented organisation – radical transparency (management by enablement and dynamic linking) and commitment to continuous improvement (improvement is endless);

- Communication changes from a command mode to conversations (adopt authenticity, attentively, open-ended questions). Managers need to encourage positive relationships for people to not feel threatened and engage in creative abrasion through diversity leading to successful innovation. The quality of the conversation in the organisation can be directly correlated with the quality of the organisations' leadership making communication critical to effective leadership; and
- The organisations' goal becomes delighting and engaging customers, transferring perspectives from inside-out to outside-in. Providing more value to core clients sooner by partnering with them and meeting unrecognized needs by innovating in stages.

(Denning 2011, pp. 17-19).

A leaders' role needs to enable employees to do extremely well, uncover their own wisdom, engage in every aspect with their work and accept responsibility for creating changes. Recognition is given to understanding that the world is constructed through relationships, conversations and dialogues. It proffers a complicated challenge of supplying increasing value to customers and engaging both customers as well as employees in dialogues. The territory of change needs to be comprehended and leaders need to identify developing conflicts as well as significant novel ideas. Change needs to be accelerated through performance communities that require building social groups. In the last decade, managerial focus shifted from the traditional factors of production to knowledge processing. Leading creative organisations and teams necessitates that leaders take an entrepreneurial stance and apply managerial skills, routines, and approaches that enable good performance by the team. Acting as a creative entrepreneur, a leader can design as well as initiate the development and maintenance of an organisations' creative capabilities (Napier & Nilsson 2006, p. 269). Creative leadership is a growing imperative, as creativity breeds innovation and requires leaders to upset the status quo, as they must become catalysts for creativity, and this requires a new set of capabilities (Meredith 2010, p. 119).

A leader needs to enable employees to do extremely well, uncover their own wisdom, engage in every aspect of their work, and accept responsibility for creating changes.

Leaders recognise that the world is constructed through relationships, conversations, and dialogues.

5.3 OPERATIONAL LEVEL: BUSINESS MODEL AND PROCESSES

Sparrow and Ringland (2010, pp. 34-35) suggest that different models are to be formulated to rebuild the economic system, based on issues such as a growing global population placing stress on the environment and an energy system supplying energy at escalating prices in anticipation of alternative energy sources. Uncertainty in the business environment necessitates that an organisation:

- renews its offerings and processes incrementally, adding up to purposeful, directed change;
- introduces mechanisms that enable adaptation; and
- use its vision to provide clarity of purpose.

(Sparrow & Ringland 2010, pp. 34-35).

An organisational strategy for creating, delivering, and capturing value is expressed in its business model. Rodrigues, Maccari & Campanario (2011, p. 738) argue that certain realities undermine the effectiveness of traditional business conduct towards a need for new models. These realities are:

- the high mobility of tacit knowledge;
- a lack of venture capital to test new ideas;
- inefficiency of the management of the innovation processes, as bureaucracy associated with its development and innovation is lengthy and costly; and
- the shortening of the life cycle of products, technologies, and markets

Innovation of strategic character in organisations focuses on the business model. Organisations remodel their business processes by designing and aligning strategies to increase their competitiveness (Rodrigues, Maccari & Campanario 2011, p. 740). The aim is the establishment of mechanisms and systems that drive innovation as the basis to develop and assure the core competence of a company. Some innovation strategies are depicted in Table 80.

Table 80: Innovation strategies.

Innovation Strategies:		
Name	Year	Strategy
Schumpeter's	2008	"Creative destruction" - sees innovation is a management tool capable of changes in the economic sectors (represents evolutionary steps of a free-market economy)
Tushman, Anderson	1980's (1986)	"Technological discontinuity" – competence of an innovation over a dominant technology in order to perfect it or destroy and replace it. (distinguish radical innovation)
Christensen	1990's	Disruptive technologies – concepts of (internal) exploitation and (external) exploration are introduced
Leifer et al	2000's (2003)	Radical approaches as an alternative to incremental strategy
Christensen; Raynor	(2003)	Focused view on business innovation – concept of sustaining innovation vs. disruptive innovation
Chesbrough	(2003, 2007)	Open innovation – organisations need to redesign their business models in an open format, focusing on the exploitation

Source: (Rodrigues, Maccari & Campanario 2011, pp. 741-742).

Khandwalla and Mehta (2004, p. 15) confirm that the style of management is a decisive factor in innovative organisations. The style of management most suitable to innovativeness is organic, displaying:

- extensive decentralisation;
- an unrestricted stream of communication, both laterally and vertically;
- accomplishment of results, rather than following set rules and procedures;
- improvisation;
- decisions emerging from the interaction between all the stakeholders in the decision;
- and
- experts on the subject having a greater say.

To be innovative, an organisation should be efficient at engendering creative ideas, as well as at implementing elected ideas efficiently. Such a representation of corporate creativity is given in Figure 61.

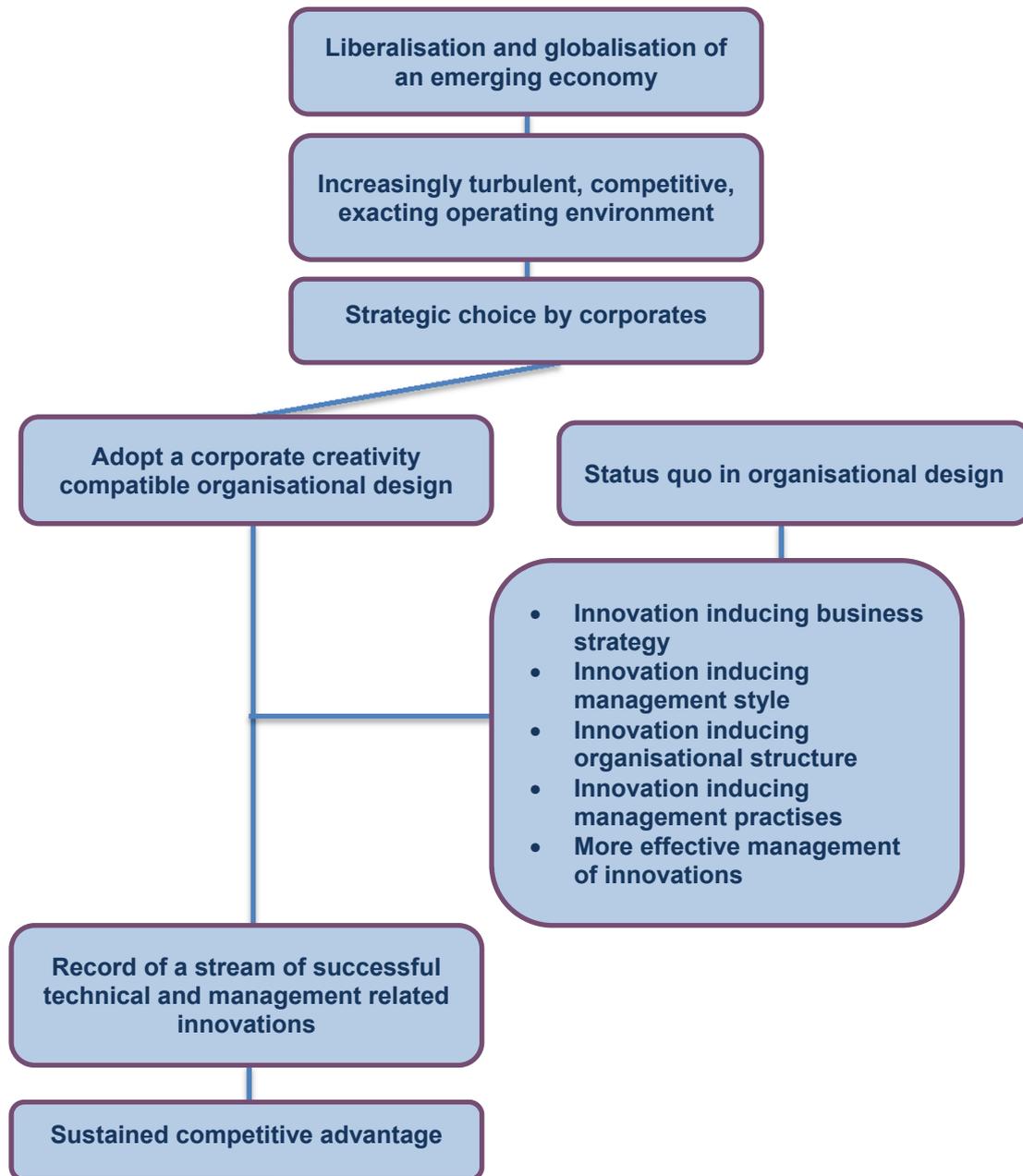


Figure 61: A representation of corporate creativity.

Source: (Khandwalla & Mehta 2004, p. 19).

Business models, being novel units of analysis, are also opportunity platforms for innovation (Stahler 2006). Business model innovation represents an important source of competitive advantage (Bojoaga, Crisan & Petrisor 2012, p. 187). Business models are conceptual tools, including a compendium of components and their connections, articulating the business logic of a particular organisation (Osterwalder & Pigneur 2002, p. 1). Slywotzky (1999) defined a business model as a business design, comprehending

the entire organisation. This comprehension includes customer selection; market offerings; internal tasks and those that will be outsourced; resource configurations; marketing strategies; as well as profit capturing. Such a business model keeps the organisation competitive, and generates the needed revenue to sustain the business by covering all the costs, rewarding stakeholders, and also reinvesting funds. This concludes that a business model is the all-encompassing system for expressing business logic and providing value to customers, while earning a profit. Business model innovation is a very perplexing component of 21st-century leadership. Crafting innovative efficiencies and/or growing into neighbouring markets define the intricacy of incrementally improving business models. It is especially challenging to develop and experiment with transformative new business models while persisting to push the performance of the current business model.

A business model framework has four pillars: 'What?', 'Who?', 'How?', and 'How much?', and depicts the logic according to which the organisation generates, delivers, and captures value for interested parties (Casadesus-Masanell & Ricart 2010; Osterwalder & Pigneur 2010). According to Chesbrough (2007), two key functions namely 'value creation and value capture' are included in a business model (Bojoaga, Crisan & Petrisor 2012, p. 188). Innovation becomes business model innovations, which are a distinct type of innovation (Hamel 2007; Morris 2006), if two or more components of a business model are reinvented to provide value in novel ways. It is about successful change in business model elements (Johnson et al, 2008; Mitchell & Coles, 2004), adding new activities or linking them in a new way, or changing which party performs what activity (Amit & Zott 2012). In a global survey (The Economist Intelligence Unit, Global survey 2005), the following observations were made:

- 54% of interviewed managers considered business model innovation a more important source of a competitive advantage, compared to product/service innovation; and
- business model innovation delivers superior returns over time, compared to product/service innovation.

(Lindgardt 2009).

The innovation paradigm pivot is thinking in terms of business models. Organisations' capability to pursue the needed adjustment will be influenced by a compendium of internal factors, for example human resource capability. The emerging-market possibilities, as well as the economic surroundings, dictate the correct type of business model to select to address these internal factors. Flanagan (2012, p. 12) described a business model as 'an organisations' blueprint for generating, supplying, and encapsulating value.' A business model needs to generate the necessary income to cover all expenses, remunerate interested parties, and invest reserves to keep the organisation competitive (Flanagan 2012, p. 12). Another description of a business model is 'a cognitive device to convert technical aspects of a product or service into economic value, and revolves around the central question of what it takes to transform technology or specific know-how into commercial successes.'

Van der Meer (2007, p. 197) argues that business model innovation requires a person to first understand what it is, before scrutinising what paths exist to improve upon it. In this context the following two fundamental functions are performed:

- value creation, by identifying a sequence of value-creating activities (creating value for the end user); and
- value capturing from the value creating actions, for the originating organisation to be sustainable over time (guaranteeing that the innovators get a fair share of the value added).

Smith (2009, p. 13) adds that tension exists between value capturing and value creation as is shown in Figure 62.

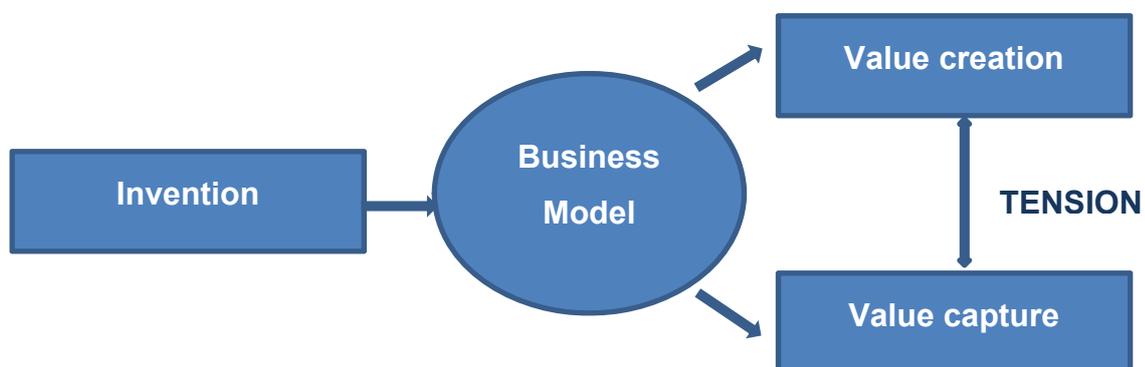


Figure 62: Functions of a business model.

Source: (Smith 2009, p. 13).

The source of economic value in the 20th century is the efficient management of knowledge stocks, including technology, product knowledge, and business processes. As with other management processes, innovation also requires specific tools, rules, and discipline to act on such insights in a manner that will lead to significant organisational improvement. An organisation needs to define a business model that will unlock the potential for invention, using commercialisation mechanisms to create and capture value.

The functions of a business model as described by Chesbrough (2007, p. 13) are provided in Table 81.

Table 81: Functions of a business model.

1. Articulate the value proposition – value created for users by the offering.
2. Identify a market segment – the users to whom the offering is useful and for what purpose.
3. Define the structure of the value chain required by the organisation to create and distribute the offering and determine the complementary assets needed to support the organisation’s position in this chain. (Should extend from raw materials to the final customer).
4. Specify the revenue generation mechanism(s) for the organisation, and estimate the cost structure and profit potential of producing the offering, given the value proposition and value chain structure chosen.
5. Describe the position of the organisation within the value network (ecosystem) linking customers and suppliers.
6. Formulate the competitive strategy by which the innovating organisation will gain and hold an advantage over rivals.

Source: (Chesbrough 2007, p. 13).

The process of organisational innovation follows a two stage model:

- initiation — including insight into the problem, collecting information, establishing a stance, assessment, and resource achievement, leading to adoption; and
- implementation (adoption) — including changes in an innovation, as well as in the organisation, original utilisation, and continued use of the innovation until it matures into a regular characteristic of the organisation.

(Staw 1990). Continuous competitive pressures on organisations force them to reconsider their business models, as well as their fundamental processes. By embracing a process view of business, organisations can enhance their overall performance (Harmon 2003). However, equally important is an appropriate organisational culture to achieve superior performance through business process change (Hammer 2004).

Giesel *et al.* (2010, p. 20) expand the thinking by reporting that business model innovation is propelled by internal factors that are dependent on three critical characteristics:

- alignment, which builds customer value by demonstrating an understanding of:
 - how to create strategic prudence, required to design a futuristic business model;
 - the possible economic impact;
 - unceasingly gauging and improving performance;
- analytical — how to measure and track course correction;
- adaptability — connecting institutional functioning, flexibility, and innovative leadership, to supplement the competence resulting in change. The focus is on collaboration and partnerships through:
 - innovation and readiness to change, while maintaining the old. Robust leadership and persistence to prevail over innate organisational inertia;
 - efficient decisions to progress with innovation, that needs an innovation culture, as well as an entrepreneurial mind-set; and
 - dynamic course correction, frequently through pilot projects.

The relationship between culture and climate on innovation is explored next.

5.4 CULTURE AND CLIMATE FOR INNOVATION

Culture is a system of informal limitations, such as norms, values, beliefs, and taboos that help to shape people's behaviour in a given society (Tang 2005, p. 25). Organisational culture focusses on appropriate organisational ideas, as well as principles, and is profoundly rooted and frequently unintentional (Isaksen *et al.* 2010). Dauber *et al.* (2012, pp. 5-6) view organisational culture as influenced by:

- the environment;
- staff members' individual value priorities; and
- the character of primary tasks in the organisation.

From an organisational culture perspective, innovation is profoundly contextual. The magnitude of an organisations' innovativeness is framed by its culture. Michela and

Burke (2000) put forward a case that, in organisations, organisational culture is entwined with quality and innovation.

Different cultures co-exist in organisations (collegium, bureaucracy, corporation, and enterprise), but the balance between these cultures, differs. Several dimensions and variations are exhibited in organisational culture. These are categorised in the competing values framework (CVF), in a two-dimensional space (Denison & Spreitzer 1991). Contrasting orientations are represented on each axis, where the first dimension signifies flexibility versus control orientation, and the second dimension signifies an internal versus an external focus. The mixture of both these dimensions delimits four types of organisational culture, namely group, developmental, rational, and hierarchical culture (Zu *et al.* 2006, p. 38), given in Figure 63.

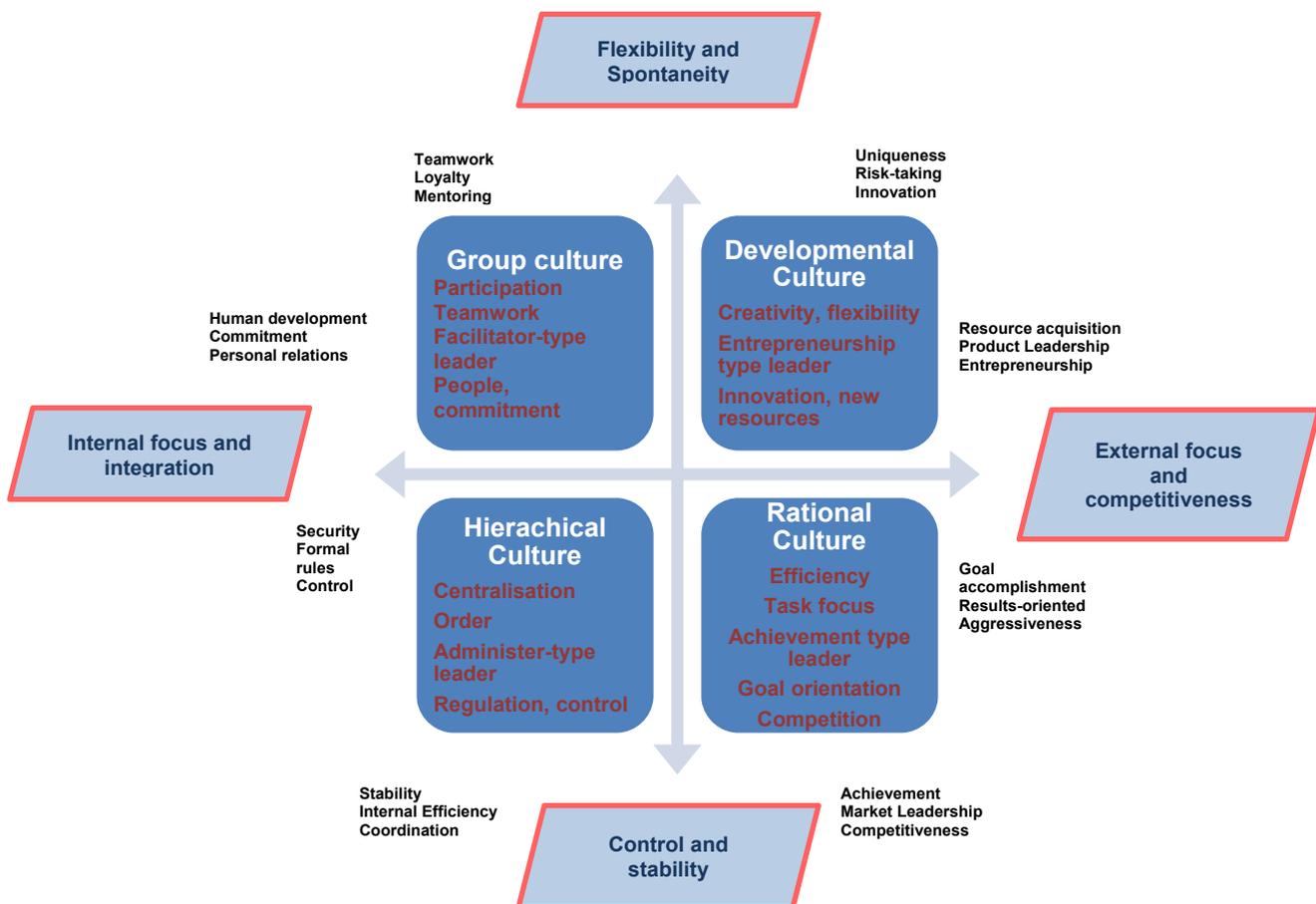


Figure 63: The competing values framework of organizational culture.

Source: (Zu *et al.* 2006, p. 38).

A supposition of CVF is that each type of culture is idealised. Dissimilar culture orientations contribute to the culture in an organisation, although one kind is more dominant than what the others are. 'A high rating on one dimension, e.g. internal orientation, does not exclude high rating at the other end, e.g., external orientation' (McDermott & Stock 1999, p. 525). Denison and Spreitzer (1991) reasoned that exaggerating any culture type may possibly lead to dysfunction, and the strength of the quadrant may perhaps even become a weakness. In any change initiative, organisational culture is critical, but there is no agreement on what type of culture best supports business transformation. An organisation should be able to accommodate diverse, opposite culture types, in accord. The organisational learning culture, a grouping of all four cultural types, is the most appropriate for business process change, and leads to superior organisational performance. A high-performing culture results in a competitive edge, and needs to grow organically, one workgroup at a time. Every employer is a builder of culture, because, through their actions, they make a culture stronger or weaker. Research by Deshpande *et al.* (1993, p. 26) proposed the possibility that innovativeness is enhanced by a certain range of cultures, with some cultures increasing the likelihood of innovation more than others do. Their research highlighted a statistically important connection between 'market and adhocracy cultures' and 'high performing companies.'

Positive cultural characteristics are vital for organisations to innovate, and need to match the organisational perspective. Culture is composed of numerous components that either enhance or inhibit the tendency to innovate. The deficiency of innovation in an organisation is compounded by the mistake of observing culture in isolation and recognising only one kind of culture, and then proposing it as a collective solution (Anderson *et al.* 2014). In the mid-1990s, it was documented by Flemming and Asplund (2007) that no organisation has a single culture, but that organisations are constituted out of many cultures. The locus of culture is at the local level, and leaders need to understand that it is difficult to exert any control over such culture. Clarification of vision- and mission statements and values, cannot govern culture.

Innovation is a means to radically influence an organisations' efficiency and effectiveness. The culture of an organisation needs to support an innovative focus, to

enhance the organisational brand and replicate or improve on the work of others. Hayton and Zahra (2002, p. 45) provided a balanced view of the culture–innovation link by classifying culture as a principal component of innovation and an intermediary in the relationship between contextual features and entrepreneurial outcomes. Organisational culture thus acts as a catalyst, rather than a causal agent of entrepreneurship. For continuous innovation through collaboration and cooperation, one needs to create discomfort in the current organisational ‘fabric’, which will create space and opportunity for change as the status quo is challenged (Urban 2007).

Strategic intent is driven by values. To successfully use culture on an enduring basis, organisations must embrace specific principles and inference about accommodating transformation, as culture can directly affect performance, and therefore assist organisations to prosper. An innovative culture can enable management to put into practice innovative approaches and tactics. Senior managers have an important function in influencing culture, since they determine priorities, such as innovation, as well as the related rewards, to combat complacency.

Lock and Kirkpatrick (1995) report that an innovation-supporting culture capitalises on behaviours that appreciate and embrace creativity and freedom, coupled with risk-taking and teamwork that are solutions-oriented. Value-seeking and communicative behaviours that instil trust, as well as respect and making quick decisions, should be entrenched in the organisation. Jassawalla and Sashittal (2003) add, organisations should reject behaviours that obstruct innovation (e.g., rigidity, control, predictability, and stability). The inclination of management has an impact on an organisation attaining a state of innovativeness by defining, instilling, and reinforcing innovation-supporting characteristics in employees. Dobni (2006, 2008) conveys innovativeness as influenced by the current structural design, as well as the community of personnel, on whom the efforts are concentrated on. Angel (2006) appraises the considerations in achieving such a culture as:

- eliminating constraints through shared knowledge and decision–making;
- nurturing prospects;
- establishing an intellectually satisfying and creative environment; and

- establishing performance indicators in order to realise continuous improvement.

An innovation driven culture has been described as a multi-dimensional context that includes the intention to be innovative, the infrastructure to support innovation, operational-level behaviours necessary to influence a market- and value orientation, and an environment that allows the implementation of innovation. In an organisational environment, innovation is articulated by behaviours or activities, associated with a tangible action or outcome. These activities and behaviours can be categorised as:

- a product- or market focus;
- process-related;
- behaviour-based; and
- strategic.

(Martins & Terblanche 2003; Robbins & Coulter 1996; West & Farr 1990).

Organisational change that evokes an increase in competitiveness, requires creativity and innovation, needs an examination of issues such as the patterns of behaviour, principles, and beliefs that influence organisational performance. Denison (2001, p. 347) suggests that organisational culture often presents, firstly, as an impression of 'the glue that holds the organisation together' and, secondly, as 'a central part of the change process'. Meredith (2010, p. 71). The authors further contribute in saying economic success stems from an array of elements such as innovation, creativity, energy, and flexibility. For these elements to flourish, leaders need to know what leadership really means. As leaders are responsible for fostering a successful and sustainable culture of innovation by:

- being aware of the impact they have on their employees and their environment; They need to bring a human perspective to the task that will enable them to close the gap between the communication of the leader and the authenticity of organisational culture; and
- dealing with and accepting vagueness. Tolerance of ambiguity permits risk-taking that is associated with courage and consideration of alternative solutions, not always producing positive business results.

Tushman and O'Reilly (1997) found creativity and innovation to be influenced by culture through socialisation processes and the value proposition that is conveyed by way of configurations, policies, as well as artefacts, procedures, and processes. The authors add that organisational culture is embedded in innovation, and is defined as the features of the organisation, described by the mutual values and beliefs of all employees. The findings of Schein (1984) states that culture reflects the personalities of staff, and is communicated and fortified by way of language, behaviours, emotions, and relationships, as well as physical settings.

Developing a culture conducive to both innovation and execution requires a delicate balancing act (Williams 2011, p. 12). Building sustainability and endurance through innovation in organisations requires a focus on the 'softer' side of the organisation, and requires comprehension of how important culture and climate are in innovation. The features of recognition and reward, need to be aligned with what the organisation wants to achieve, otherwise employees can react guardedly and indecisively. Leaders of successful organisations build organisational cultures and climates, to enable the energy of renewal to build a durable ecosystem of groups of people who are headed for innovation (Williams 2011).

Van der Meer (2007, p. 192) confirm there are two ways of stimulating innovation in an organisation: culturally (crafting an innovative climate) or structurally (the methodical use of innovation methods). The author lists factors in Table 82, illustrating that both attitudes and values are important for an innovative culture.

Table 82: Factors important for an innovative culture.

Negative influence	Factor	Positive influence
Short	Horizon	Long
Keep out	Maverick	Accepted
Punished	Failures	Tolerated
Formal	Communication	Informal
Kept out	Uncertainty	Accepted
Analyses	Planning	Action
Means	Planning	Opportunities
Closed	External co-operation	Open
Automatic	Decision-making	Participative
Internal	Orientation	Customer
Vague	Strategy	Clear

Source: (Van der Meer 2007, p. 193)

Studying organisational culture and the multidimensionality and complexity of organisations necessitates a multidisciplinary approach. Different approaches to studying organisational culture are classified as: dimension approaches (most prominent), interrelated structure approaches, and typology approaches (Dauber *et al.* 2012, pp. 5-6). Existing models do not explain organisational dynamics and complexity, whereas Scheins' model introduces well-defined processes explaining how and why changes happen in organisational culture and other organisational areas. The model also explains the association between strategy, structure, culture, and the environment, both internal and external (Dauber *et al.* 2012, p. 2). The model was developed based on the review of recognised organisational culture models or models including organisational culture. Hatch (1993) extended the model by Schein (1985) that attends to observable and unobservable elements of culture to include a fourth domain and defines the processes (manifestation, realisation, interpretation, symbolisation) that link the different constructs (Dauber *et al.* 2012, p. 8). Hatch's model is given in Figure 64.

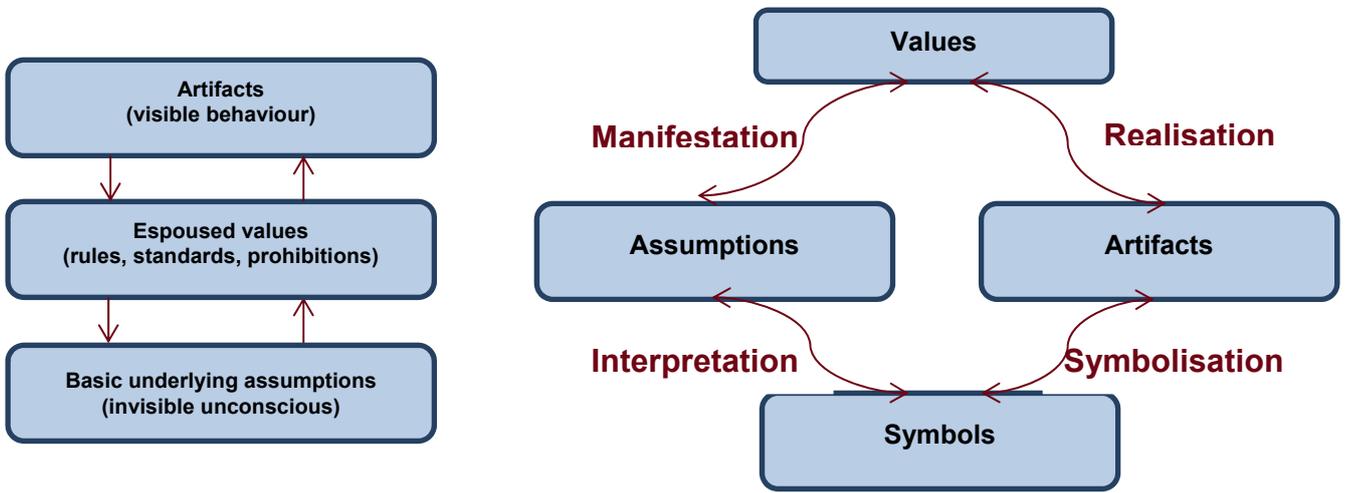


Figure 64: Hatch's model of domains and processes.

Source: (Hatch 1993, p. 660).

The model by Homburg and Pflesser (2000) clarifies the association between performance results and organisational culture, emphasising marketplace energy. This model distinguishes between artefacts and behaviour, but fails to consider interactions. Allaire *et al.* distinguished between the external and internal environment. They positioned the socio-structural system in line with the culture system, and stated that organisational output may well influence organisational culture (Dauber *et al.* 2012, pp. 10-11). The model by Homburg and Pflesser is given in Figure 65.

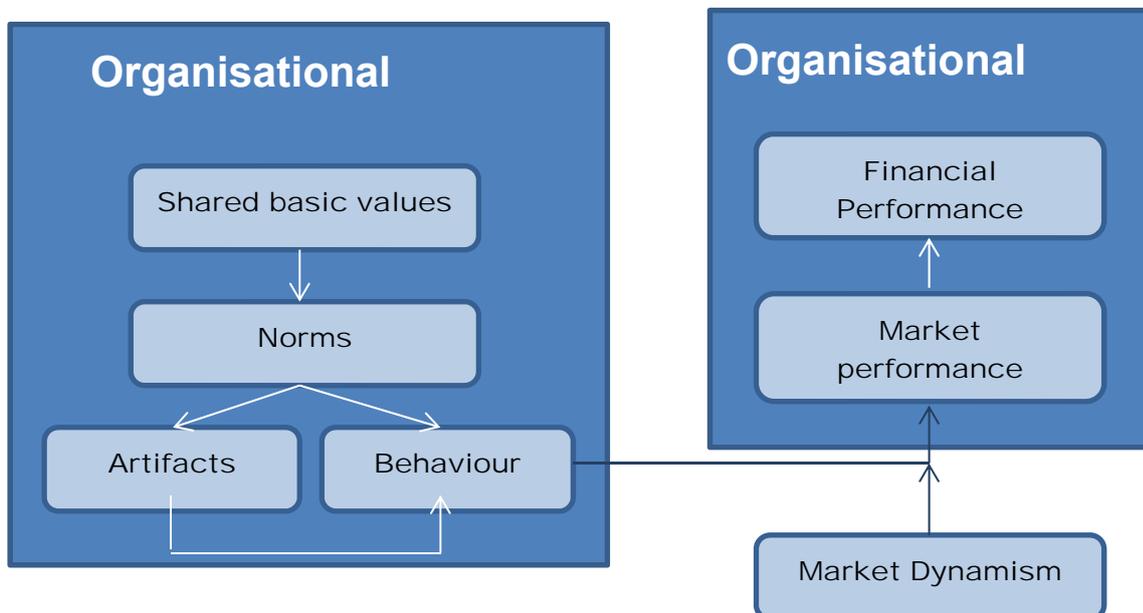


Figure 65: Model by Homburg and Pflesser.

Source: (Dauber *et al.* 2012, p. 11).

Hatch and Cunliffes' model (2006) illustrates the domains of organisational culture: value and belief, strategy, structural system, organisational activities/operations/actions, external environment, and internal environment. All these domains are linked, but no specific processes are identified, as is depicted in Figure 66.

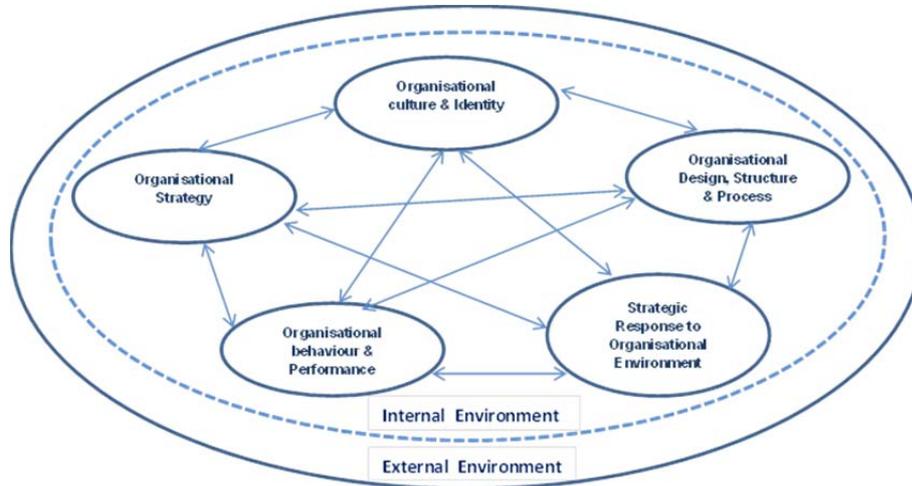


Figure 66: Processual-contextual perspective.

Source: (Dauber *et al.* 2012, p. 12).

The configuration model in Figure 67 of organisational culture differentiates between spheres (e.g., organisational culture, identity, strategy, design structure, processes, and organisational behaviour performance) and processes that explain relationships between the different elements of the model (Dauber *et al.* 2012, p. 12). A configuration model of organisational culture is given in Figure 67.

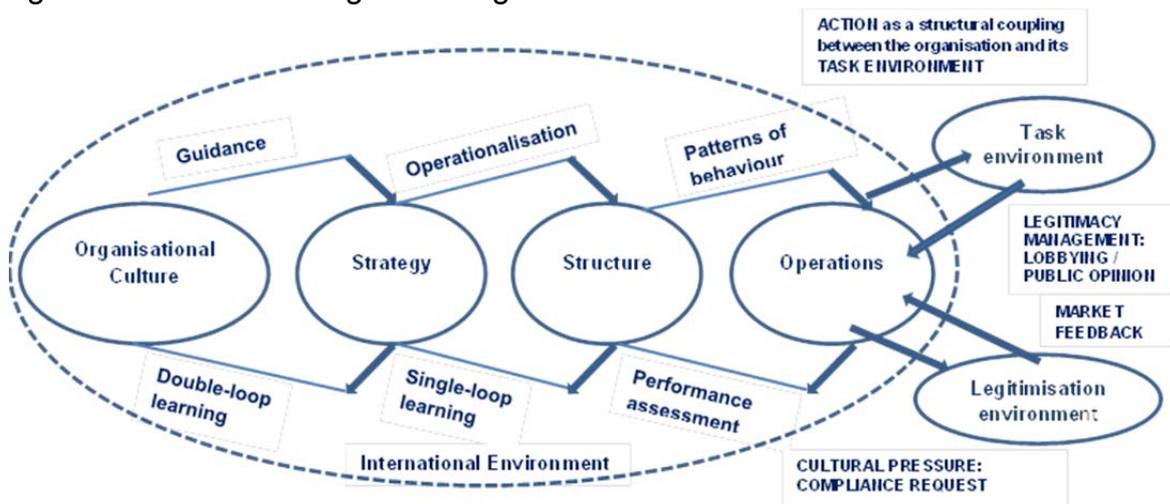


Figure 67: Configuration model of organisational culture.

Source: (Dauber *et al.* 2012, p. 22).

Martins (1989) based his model on the work of Schein (1985), describing organisational culture by drawing from open systems theory (initially developed by Ludwig van Bertalanfy in the 1950s, and improved upon by Kast and Rosenzweig (1985), as well as Kreitner and Kinicki (1995)). Martins study aimed to ascertain the nature of organisational culture responsible for creativity and innovation. Prominent changes included issues on operational level, such as alignment with customers, the working milieu, support from management, and trust relationships. Trust relationships manifest in honesty and genuineness, and impact employee support of possible successful change, influencing the extent of encouragement of creativity and innovation. Senge *et al.* (1999, p. 44) pointed out that sincerity frequently plays a significant part in intense change processes. There is no agreement in the literature on the kind of organisational culture that promotes creativity and innovation (Robbins & Judge 2012, p. 73). The dichotomy in this regard is that 'organisational culture can promote the creativity and innovation that are necessary to be competitive and successful, but, on the other hand, it can also be an obstacle to creative and innovative behaviour' (Glor 1997, p. 44; Tushman & O'Reilly 1997, p. 31, p. 35). The rationale of Martins research was to ascertain measurements to determine the organisational culture that may promote creativity and innovation.

Martins (2002) established and amalgamated the elements of an organisational culture that enhance creativity and innovation. A model founded on work of Martins (1989; 1997) illustrates organisational culture and highlights the significance of leadership in creating organisational culture. Determinants of organisational culture that influence creativity and innovation, are given in Figure 68.

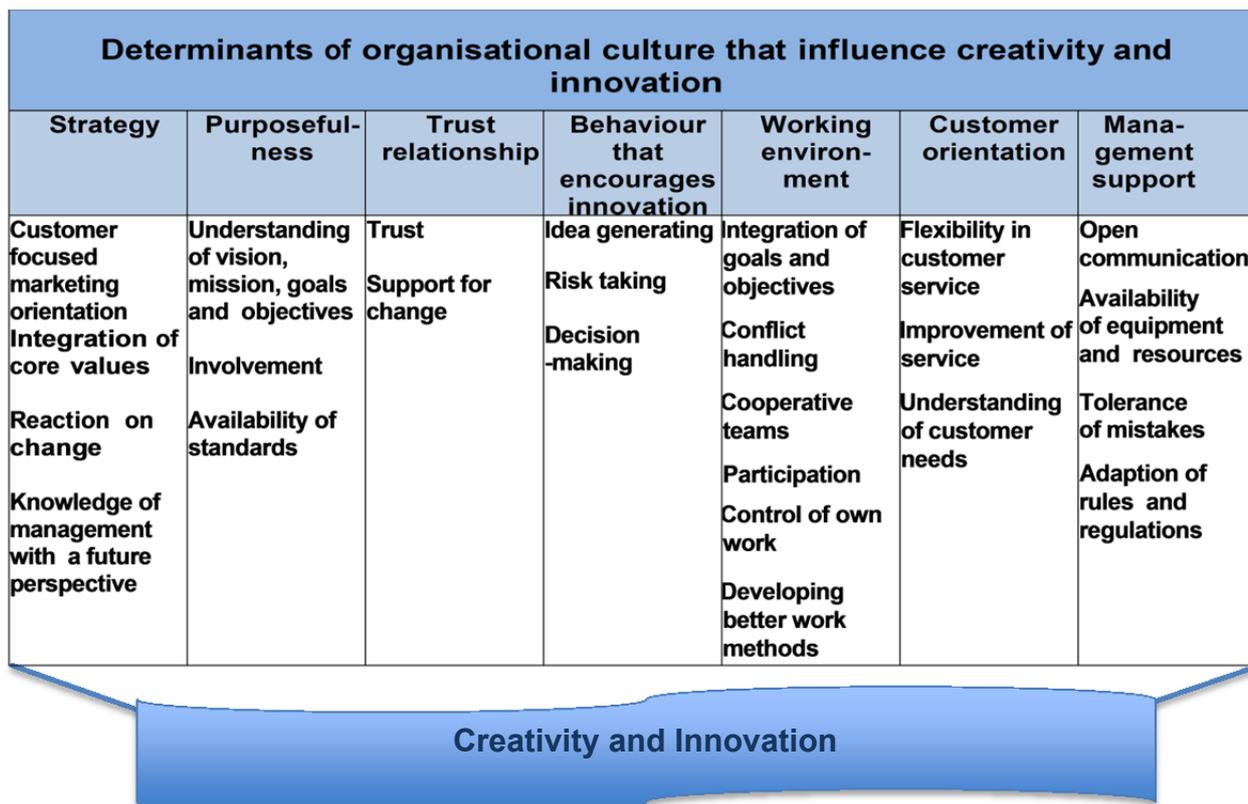


Figure 68: Determinants of organisational culture influencing creativity and innovation.

Source: (Martins & Martins 2002, p. 62).

The systems approach clarifies the collaboration between organisational subsystems (goals, structure, management, technology, and psycho-sociological). In each element, the role of management is emphasised. The systems approach is holistic, and accentuates the interdependence between the subsystems and their elements in an organisation (French & Bell 1995). The intricate collaboration on different levels between individuals and groups, as well as with other organisations and the external environment, can be seen as the primary cause of behaviour in the workplace. The innovation culture continuum is given in Table 83 and the dimensions of innovation culture is given in Table 84.

Table 83: The innovation culture continuum.

Foundation	Advanced	Breakthrough	
Hierarchical Command and Control	Departmental Silos	Self-directed Virtual Teams	Management
Transactional and Aggregate	Integration across the Enterprise	Learning & Service Delivery Architecture	Information
Cost and Risk Reduction	Productivity Improvement	Collaborative Improvement	Customers
Product	Segmented but still Product	Customers' Individual Needs and Value	Operations
Growth	Growth and Performance	Innovation	Strategy

Source: (Angel 2006, p. 3).

Table 84: Dimensions of innovation culture.

Dimension	Factor (Factor Description)	Author
Innovation intention	Innovation Propensity (The degree to which the organisation has a formally established architecture to develop and sustain innovation, communicated through vision, goals and objectives and operationalised through the business model and processes.)	Tesluk et al. (1997), Christensen and Raynor (2003), Martins and Terblanche (2003), Dobni (2006, 2008)
	Organisational Constituency (Considers the level to which employees are engaged in the innovation imperative and how employees think of themselves vis-à-vis their colleagues in respect to value, equity and contributions made within organisation.)	
Innovation infrastructure	Organisational learning (The degree to which the training and educational opportunities of employees are aligned with innovation objectives.)	Syrett and Lammiman (1997), Tushman and O'Reilly (1997), Hurley and Hult (1998), Martins and Terblanche (2003), Dobni and Luffman (2003), Wang and Ahmed (2004), Dobni (2006, 2008)
	Creativity and Empowerment (The degree to which the organisation has a formally established architecture to develop and sustain innovation, communicated through vision, goals and objectives and operationalized through the business model and processes.)	
Innovation influence	Market orientation (This involves the market sensing and contextual awareness behaviours of employees. It considers the extent to which employees generate and disseminate knowledge on customers, competitors, the industry, as well as their understanding of the value chain or cluster in which they operate.)	Kohli and Jaworski (1990), Narver and Slater (1990), Jaworski and Kohli (1993), Deng and Dart (1994), Hurley and Hult (1998), Hult and Aldas-Manzano et al. (2005), O'Cass and Ngo (2007)
	Value orientation (The degree to employees are focused on and involved in the process to create value for customer/clients.)	
Innovation Implementation	Implementation Context (Involves the organisation's ability to execute value-added ideas. It considers the ability to proactively co-align systems and processes with changes in the competitive environment.)	Day (1990), Kohli and Jaworski (1990), Bossidy and Charan (2002), Dobni and Luffman (2003), Marinova (2004), Wang and Ahmed (2004)

Source: (Dodni 2008, p. 541).

With behaviour-based strategic and spontaneous situations (Martins & Terblanche 2003; Robbins & Coulter 1996; West & Farr 1990), the measure of success depends on the character of the outcome, and is measured against changes in performance. An organisation is believed to be innovative, as a result of its focus on dimensions and activities that need to be present in order to innovate. An innovation process stages model is given in Figure 69.

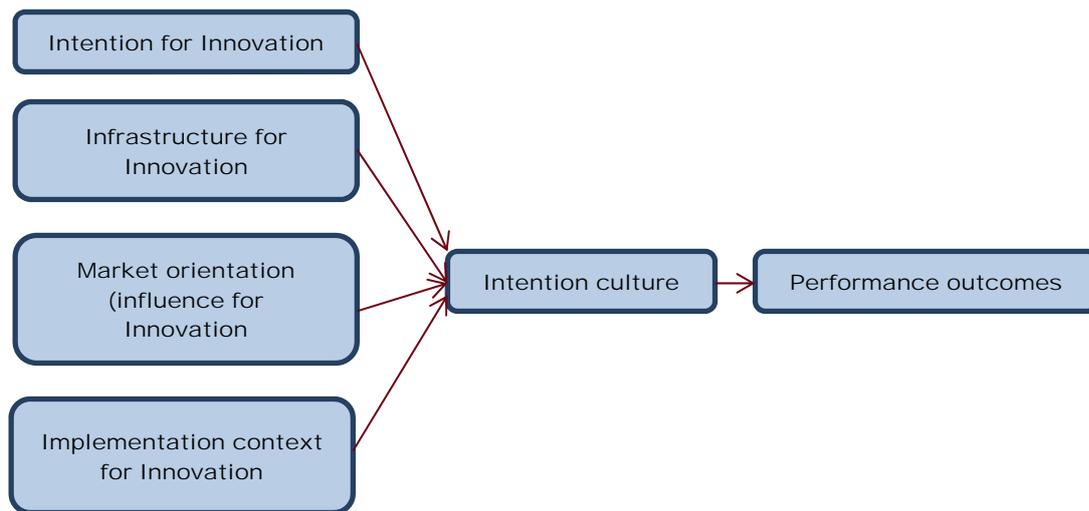


Figure 69: Model of Innovation process stages.

Source: (Dodni 2008, p. 541).

Culture is a type of knowledge, and ought to be considered as an organisational resource and, accordingly, an object to be knowledge managed. Culture is defined as a collection of characteristics (spiritual, material, intellectual, and emotional), and such a system of collectively created significance, principles, and beliefs defines a social group. Such a social group collectively joins ways of doing, for example basic individual rights, traditions, and beliefs (UNESCO 2003). Members of a given culture share socially constructed meaning, and deal with issues relating to the ecosystem (Hofstede 1980). Nationwide culture tends to positively affect national economic creativity, and has a propensity to be influenced by the cultural principles of the people, to create and to innovate. Culture, the main hurdle in the innovation process, affects most of the key elements of innovation, such as strategy, team structure, level of change achieved, and the time frame for the current focus of the business, but can be overcome when the

economy and organisations are moving in favour of change. As innovation is multi-dimensional, incremental innovation helps to create such a culture of innovation, either increasing operational effectiveness or changing the business model by shifting spending from running the business to transforming the business.

Kharkhurin and Motalleebi (2008, p. 404) report that diverse cultures contribute different concepts of creativity, and use dissimilar psychological processes when they engage in creative endeavours. The environment can either positively or negatively influence peoples' creativity. Creativity as a concept is decided and moulded by sociocultural values and norms, which, may have an influence on the way in which creative potential is captured and incarnated. Martins and Martins (2002) continue by adding that a creative environment is fundamental to the creative process, while leadership stimulates the creativity of people. Strategy, structure, support mechanisms, and communication are facets of organisational culture that influence creativity and innovation.

Isaksen *et al.* (2010, p. 75) argue the fact that culture and climate are closely related concepts. Climate is perceived as the encapsulation of an organisation's real priorities. The authors report climate as a concept, conventionally stemmed from the work of organisational theorists, who applied the notion to indicate social climates, created by leadership. Members of an organisation infer the climate from the organisation's practices, procedures, and reward systems. They perceive climate 'as a collective perceptual construct reflecting a lower level of abstraction based on observed patterns of interaction and behaviour'. Culture is an indication of the organisational climate, referring to deeply seated philosophies and principles. Philosophies and principles are not noticeable at the same level as climate. Philosophies and principles manifest in the behaviour and actions of people in response to environmental stimuli, while climate manifests in the organisational practices and policies. The understanding that personnel have of organisational reality leads to the organisational culture.

Humans side with and support that which allows them to accomplish their own individual ends, and, sometimes, these coincide or conflict with those of the organisation. Climate

is the customs and actions that label these awarenesses. Scheider (1975) defined four factors that define climate:

- the character of interpersonal associations;
- the character of the hierarchy in the structure;
- the character of work; and
- focal point of support, recognition, and rewards.

(Scheider *et al.* 1975).

Embracing change necessitates that the creativity of employees is encouraged by increasing their dedication and involvement in realising business outcomes. For employees to be enthusiastic and to do their work effectively by applying knowledge creatively, engagement and motivation are a necessity (Amabile 1998). Employee engagement, a social process, occurs when people become personally involved. Flemming and Asplund (2007) highlighted the fact that the working environment either energises employees and fosters their learning and growth, or it enervates them and frustrates their development. Organisations change when the beliefs and behaviours of the people within it change (Hunter *et al.* 2007, pp. 69-70).

Climate variables, differentiated between best- and worst-case work milieus, that may influence creative achievement have been identified in two synchronised research programmes (Isaksen & Ekvall 2010, p. 76), and are given in Table 85.

Table 85: Climate variables that might influence creative achievement.

Theory	Researched by	Model
Theory of intrinsic motivation was used by Amabile in developing the eight dimension model	Amabile & Conti, 1999; Amabile, Conti, Coon, Lazenby, & Herron, 1996; Amabile & Grykiewicz, 1989	<ul style="list-style-type: none"> • Work • group support, challenging work • organizational encouragement, supervisory encouragement • organizational impediments • freedom • workload pressure • sufficient resources
West and his colleagues used a theory of team interactions to develop the four dimensional model	Anderson & West, 1988; Bain, Mann, & Pirola-Merlo, 2001; Burningham & West, 1985; West et al., 2003	<ul style="list-style-type: none"> • participative safety • support for innovation • challenging objectives • task orientation
The dispositional model proposed is based on a theory of underlying psychological processes that led to the development of a nine dimension model	Ekvall, 1986; Ekvall & Ryhammer, 1999; Isakson & Lauer, 2002; Isaksen, Lauer, Ekvall, & Britz, 2001	<ul style="list-style-type: none"> • challenge and involvement • freedom • trust and openness • idea time • playfulness and humour • conflict • idea support • debate • risk-taking
Approaches based on organizational re-enforcers	Abbey & Dickson, 1983	
Environmental appraisal requirements for new product development	Thamhain, 2003, Tesluk et al., 1997, Mossholder & Dewhurst, 1980	
Organizational learning theory	Lapierre & Giroux, 2003	

Source: (Isaksen & Ekvall 2010, p. 76).

Currall *et al.* (2001, p. 71) state that both job- and group characteristics moderate the relationship between climate and indicators of creativity and innovation. Organisational size and resources are positively related to innovation, but also interact with climate by allowing organisations to act on the ideas flowing from a creative climate (Nystrom *et al.*, 2002). Added to this, other organisational variables that may moderate the relationship between climate and creative achievement include:

- horizontal, as opposed to vertical, structuring (Russell & Russell 2002);
- capital intensity (Hunter *et al.* 2007);
- professionalization (Damanpour 1991); and
- organisational learning with regard to innovation (Cohen & Levinthal 1990).

Environmental turbulence was found to be positively related to both a creative climate and the adoption of a corporate strategy emphasising innovation (Russell & Russell 2002). Based on work by Borrill *et al.* (2002) with regards to the influence of market demands on the relationship between climate and innovation, Janssen *et al.* (Janssen, Van De Vliert & West 2004) contended that turbulence, production pressure, and competitive pressure not only establish a need for innovation, but position climate as a further important influence on creative achievement.

The concept organisational learning is explored next.

5.5 ORGANISATIONAL LEARNING

Innovation of new offerings occurring in networks of people and organisations resemble organic structures (Napier & Nilsson 2006, p. 271). The intrinsic motivation of staff is encouraged by enhancing their sense of ownership, by methodically eliminating barriers and giving people targets to achieve, coupled with independence regarding the process. Innovation depends on extraordinary individuals with boundless interaction between them (Spoelstra 2010). Engaging teamwork removes restrictions from people to share knowledge and enhances decisionmaking. Such a task culture, associated with a matrix structure, is beneficial to innovation, but also to organisational learning (Anderson 2002), either intentional or unintentional learning.

Intentional learning happens as a result of the persistent and focused energy applied in a committed, self-directed, purposeful manner to the task at hand. It features the self-motivation to engage, the self-direction to achieve goals, and taking responsibility for learning autonomously. The staff members' role within the team is to question, associate, reflect, and apply knowledge to create, act, and complete the task. Intentional learning is contingent on the persons' conception of knowledge, how meaning is connected, and how that knowledge is used to act or create, and the persons' perceptions of the task or activity (Vosniadou 2003). Incidental learning is accidental or unintended learning resulting from other endeavours, and happens by way of social interaction, as well as problem solving, repetition, and observation (Cahoon 1995; Rogers 1997). It is a form of

unplanned learning (indirect or additional) within an informal or formal learning situation (Schneider 2009). Other sources of unintentional learning include:

- implicit meanings *in lieu* of expectancies and/or governance in the workplace (Leroux & Lafleur 1995);
- deliberating/observing tasks with co-workers and/or specialists (Van den Tillaart & Poutsma 1998);
- blunders, suppositions, ascriptions, and principles (Cseh, Watkins & Marsick 1999); and
- being compelled to go along with or attune to situations (English 1999).

Incidental learning often happens in the workplace while tasks are performed (Baskett 1993, p. 25; Cahoon 1995). The features of this 'natural' method of learning (Liao 1997) are deemed largely successful when it is situated, contextual, and societal.

Walter *et al.* (2013, p. 4) stated that effective organisational learning is dependent on the expenditures on learning activities, the constructive alignment between expenditures, and the extent of exploration typical of the learning tasks (Walter *et al.* 2013, p. 1). Core to strategic management is that it can be used as mechanisms for organisations to expand their present and/or future capabilities (Nag, Hambrick & Chen 2007, in Walter *et al.* 2013, p. 14). Such strategic initiatives require learning activities that are not inherently definite, and that could vary in importance (Argote & Miron-Spektor 2011; Crossan & Berdrow 2003). An exception is strategic initiatives targeting the enhancement of current competences (i.e., low measure of exploration), displaying a fragile connection amongst learning actions and execution. A stronger link connecting learning actions and initiative performance is expected when strategic initiatives stretch further than the organisations' current capabilities (i.e. a high measure of exploration).

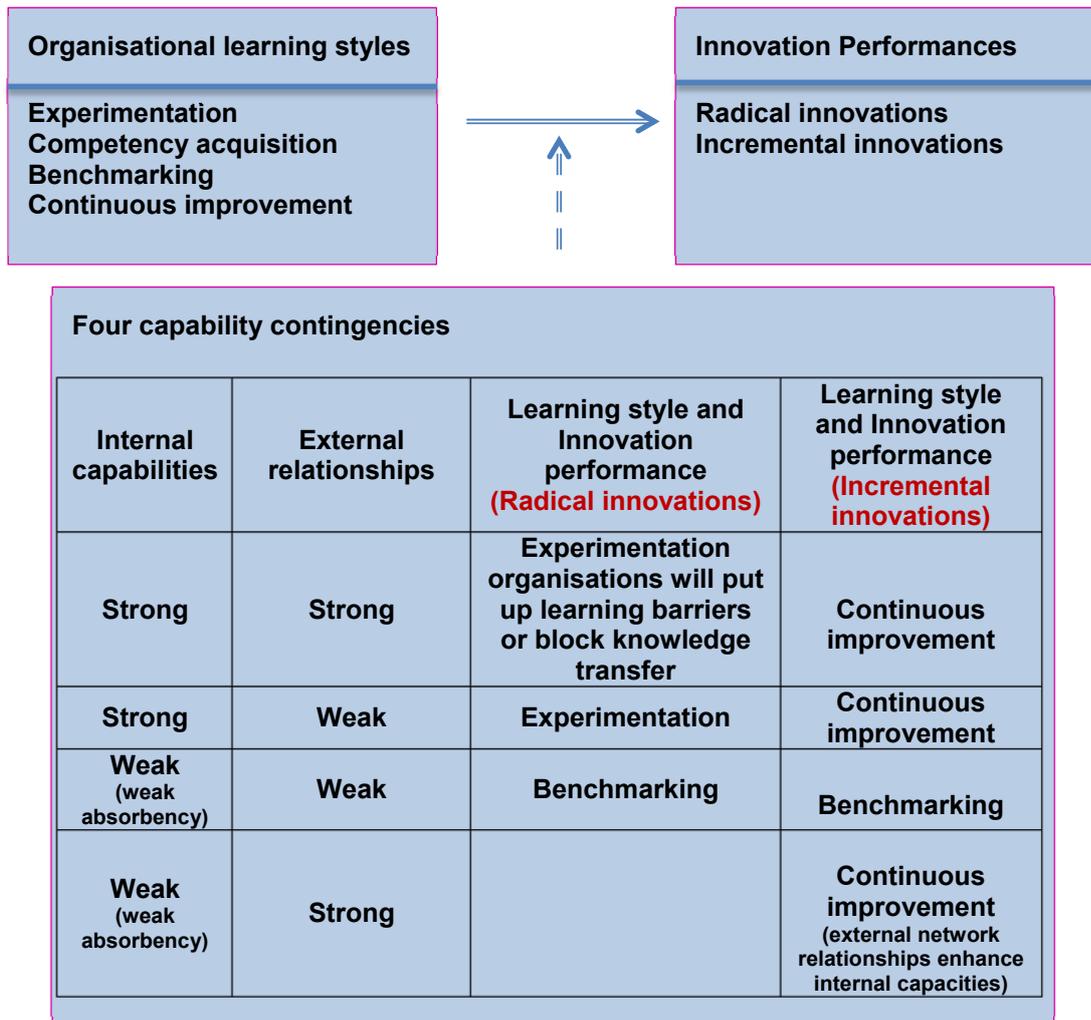
Organisational learning is defined in the literature as the process that improves either prevailing capabilities or produces novel ones (Zollo & Winter 2002). Such organisational learning signifies the ability to deploy tangible or intangible assets to execute an assignment (Amit & Schoemaker 1993), and plays an important role in the manner in which organisations attain a competitive advantage (Barney 1991; Peteraf 1993). Nonaka (1994) stated that these capabilities transpire in individuals. Groups need to

interpret and integrate these novel ideas and happenings, so that individual learning can be transformed into organisational competencies (Kostopoulos *et al.* 2013; Nonaka 1994). A crucial intermediary between individual learning and growth in organisational capability (Edmondson 2002) is group-level processes.

Strategic initiatives have the ability to significantly impact on the competence base of an organisation (Lechner & Kreutzer 2011). Such initiatives, expressed as interim, matched undertakings, are suited to the analysis of group learning-processes, as they mirror a mutual level of analysis, aimed at organisational learning and revitalisation (Edmondson 2002; Gibson & Vermeulen 2003). Likewise, they are effortlessly recognisable and empirically noticeable (Lovas & Ghoshal 1998), compared to more abstract concepts that incorporate routines (Nelson & Winter 1982), capabilities (Zollo & Winter 2002), and organisational explanatory diagrams (Rerup & Feldman 2011). Strategic initiatives are a pivotal link between an organisation and its external milieu (Lovas & Ghoshal 1998), and are crucial to organisational learning (Cohen & Levinthal 1990).

Superior performance flows from the results of innovation. Diverse learning styles are adopted by organisations, dependent on their internal capabilities and their external relationships. When combining internal capacity and external relationships, four distinctive contingencies are identified. These contingencies are given Table 86.

Table 86: Combining internal capacity and external relationships.



Source: (Chien *et al.* 2015, p. 16).

Interdependence exists between cognition and organisational learning behaviour (e.g., Edmondson 2002; Lechner & Floyd 2007). Organisational learning was described by Simon (1969) as ‘individuals who develop insights and effectually restructure organizational problems, reflected in the structural elements and outcomes of the organization.’ Within organisational learning processes, cognition affects behaviour, while behaviour affects cognition (Argote & Miron-Spektor 2011; Vera & Crossan 2004). Tactical initiatives are responsible for growing and enhancing an organisations’ capability basis through learning actions, comprising of obtaining, merging, or disseminating of information, as well as knowledge (Argote & Ingram 2000), in addition to actions related

to incorporating this knowledge into current or newly acquired competencies (Zollo & Winter 2002). The reason for incorporating this knowledge is to generate different solutions, and then choose the most effective approach by applying questions and challenging hypotheses, in search of distinctive perspectives, inside and outside of the organisation (Edmondson 2002; Gibson & Vermeulen 2003; Van Der Vegt & Bunderson 2005). Such action comprises trying out novel arrangements and fostering novel processes, while also designing trial projects that exhibit the viability of particular results (Edmondson, Bohmer & Pisano 2001; McGrath 2001).

The grouped learning activities in strategic initiatives are searching, processing, codifying, and practising, as is described in Table 87.

Table 87: Grouped learning activities in strategic initiatives.

Four learning activities				
	<p>Searching (initiative members' receptiveness to and efforts in acquiring new knowledge and information from both within and outside the initiative (Flores, Zheng, Rau, & Thomas, 2012; Garvin, 1993; Huber, 1991; Katila & Ahuja, 2002; Wielemaker, Volberda, Eifring, & Baden-Fuller, 2003).)</p>	<p>Processing (the information-assimilation process whereby initiative groups analyze data, discuss issues, consider alternatives, and reach decisions about particular courses of action (Crossan et al., 1999; Flores et al., 2012; Garvin, 1993; Huber, 1991; Wielemaker et al., 2003).)</p>	<p>Codifying (efforts to put concepts, procedures, and the like into written form so that they can serve as guides to coordinated action in the improvement of existing or the development of new capabilities (Crossan et al., 1999; Flores et al., 2012; Gibson & Vermeulen, 2003; Levitt & March, 1988; Szulanski, 1996; Wielemaker et al., 2003; Zollo & Winter, 2002))</p>	<p>Practising (the extent to which a group exercises and repeats the behaviors associated with newly gained knowledge and skills (Edmondson et al., 2001; Eisenhardt & Martin, 2000; Flores et al., 2012; Garvin, 1993; Nelson & Winter, 1982; Stacey, 1995))</p>

Cyert and March (1963); Argyri and Schön (1978)	Acquisition	Processing	Storage	Application
Kolb (1984)	Concrete experience	Reflective observation	Abstract conceptualization	Active experimentation
Levitt and March (1988)	Organizational search	Interpretation of experience	Organisational memory	Learning from direct experience
Huber (1991)	Searching and noticing	Knowledge acquisition/ information interpretation	Organisational memory	
Walsh and Ungson (1991)	Acquisition		Retention	Retrieval
Thomas et al. (1993)	Scanning	Interpretation		Action
Nonaka (1994)		Combination / socialization	Externalisation	Internalisation
Zollo and Winter (2002)	Scanning	Evaluation	Retention	Replication
Crossan and Berdrow (2003); Vera and Crossan (2004)		Interpreting	Integrating / Institutionalising	
Gibson and Vermeulen (2003)	Experimentation	Reflective communication	Codification	
Wielemaker et al. (2003)	Linking	Interpretation	Integration	
Flores et al. (2012)	Acquisition	Interpretation	Integration / Organisational memory	Distribution

Source: (Walter *et al.* 2013, p. 5).

These learning activities have several attractive characteristics:

- their substance reverberates with a host of additional conceptual frameworks regarding organisational learning; and
- the mix of cognitive and behavioural learning represented matches the prominence in recent literature given bearing in mind both organisational learning forms concurrently (e.g., Argote & Miron-Spektor 2011; Vera & Crossan 2004).

There exists an established relationship between performance results and each of the grouped learning activities (Crossan & Berdrow 2003; Katila & Ahuja 2002; Zollo & Winter 2002).

The cognitive similarities on significant dimensions concerning person and innovation, decide organisations staff affective and behavioural responses to innovations. The person-innovation fit is analysed in the next section.

5.6 HUMAN FACTORS: PERSON–INNOVATION FIT

Researching creativity in organisations has led to the need to develop approaches for the combination of personal and environmental factors. According to Livingstone *et al.* (1997), research ‘examining both person and environment factors is very limited as is research examining different versions of fit.’

Innovation adoption is an integrative model, in which the effectiveness of adoption is an organisation-level construct. According to research by Choi and Price (2005, p. 86), the greater the congruence between innovation values and personal values is, the greater the strength of their commitment to implementation will be. Organisations commit to innovation in line with their organisational values, while a person adopts innovation in-line with his or her personal values. The greater the congruence is between abilities required by an innovation and current abilities of a person is, the greater the level of the commitment to implementation will be (Choi and Price 2005, p. 86).

Implementing innovation in any organisation is a high-risk undertaking. Previous research has shown that the success rate of an implementation effort is ultimately determined by employees’ reaction to the specific innovation. This finding by Hartwick *et al.* (Hartwick & Barki, referenced by Choi *et al.* 2005) makes it important to understand how employees react to an escalating number of innovations. Referencing literature concerning the ‘person–environment fit’, a study by Choi *et al.* 2005) indicated that ‘congruence between innovation values and personal values is more strongly related to employees’ commitment to implementation than to implementation behaviour, whereas the congruence between required abilities and current abilities is more strongly associated with implementation behaviour than with commitment to implementation.’ The study proposed that compatibility between person and innovation, the person–innovation fit, is a predictor of the willingness of a person to accept and use innovation. Thus the results suggested that ‘different types of fit (value-fit versus ability-fit) predict different types of individual outcomes.’ Another unexpected pattern was that, not the fit between the person and the environment, but rather either the person or the environment becomes a dominant predictor of particular outcomes. The results may have been influenced by the cultural context.

Creativity is a process of fit between personal and organisational factors, resulting in the creation of innovative and functional ideas and/or products that may influence individuals' responses. A sound understanding of the individuals' abilities and values and the organisations' demands and supplies is needed. This will lead to an understanding of the environmental factors that affect creativity, either positively or negatively. Innovation is encouraged by factors such as divergent thinking, flexible organisational structures that promote increased autonomy, adequate financial and material resources, and enriched jobs. Creative leadership and a work climate that increases peoples' intrinsic motivation to engage in a task can also contribute to the improvement of employees' creativity.

5.7 CONCLUSION

Chapter 5 explored some factors that have an effect on innovation adoption. On a strategic level leadership and management was emphasised while on an operational level business model and processes were highlighted. As the extent of an organisations' innovativeness is framed by its culture, the role of culture and climate was defined and its impact explained. It was explained how organisational learning can ensure organisations foster new opportunities. The chapter concluded with the fit between personal and organisational factors. In the next chapter HE as the change territory and the environment in which this study is situated, will be explored.

CHAPTER 6: LITERATURE REVIEW - HIGHER EDUCATION AS THE CHANGE TERRITORY

6.1 INTRODUCTION

Becker (2002, p. 3) conceived an 'age of human capital.' The skills, knowledge, and enterprise of everyone is responsible for the prosperity of individuals and nations, instead of only the few fortunate individuals responsible for steering industrial capitalism. The crucial role of education in such a competitive national economy and as the foundation of social justice, as well as social cohesion portrayed in social policy, mirrors his conception. HE is positioned within the epicentre of social, cultural, and economic initiatives, as a result of its core functions, which include teaching, research, and community engagement.

For reform to meet wider social-economic goals, it needs to be supported by change strategies that speak to the essential function of the institution. Core functions are embroiled with deep-seated cultural values, and are well-preserved in particular modes of internal governance. HE is a generator of economic growth. It fuels the supply of high-level skills as well as the technological enhancements for improving productivity and opening up novel markets. A quality higher education system is well connected internationally and enables the induction of novel ideas. It nurtures trade and further links with foreign countries, by way of students and researchers on the move, across national frontiers (Williams 2012).

In order to contextualise the possibilities of change in HE, the nature of it must be grasped. The adoption of transformation requires clear organisational plans, strong leadership, and sustained commitment (Garrison & Vaughan 2013, pp. 24-25), framed by critical self-reflection for change, associated with learning technologies. Further consideration needs to be given to challenges within the HE institution, such as policies, resources, human resource factors, action plans, faculty-support issues, and support-work practices and processes. In a social context, teaching and learning environments are dynamic, and demand a collective vision and vigour that touches the whole

organisation (Taylor *et al.* 2013, p. 54). The underlying forces of change are contingent on the degree to which the organisation's strategy, structure, and culture blend in unity (Taylor *et al.* 2013, p. 58).

Khandwalla (2006, p. 1) is of the opinion that organisations in a highly competitive environment that learn to be innovative can reap sustainable competitive advantage, as well as grow and thrive. To initiate innovativeness, HE has to adopt an innovation-friendly organisational design, and incorporate it into the core curricula. The author continues by adding that the organisational design needs to deliver on value propositions that facilitate:

- an organisational mind-set geared towards change, so that out-of-date activities can be discarded, to create room for innovations;
- a vision that encourages an essential intellect to stimulate innovation;
- pervasive change and innovation throughout the organisation;
- continuous improvement and innovation; and
- potential innovation leading to radical innovations.

Having identified the significance of HE, an all-inclusive suite of indicators is necessary to assess the worth and quality of a country's HE system. Research by Altbach and Salmi (2011) evaluated the functioning of national HE systems in 48 countries. Twenty variables were measured, grouped under resources, environment, connectivity, and output. Within each grouping, rankings were combined into an overall ranking. The USA outshined Sweden, Canada, Finland, and, lastly, Denmark. High rankings on output tend to be associated with high rankings on resources. Research output and government funding are correlated, particularly with regard to the spending on R&D. The relationships between different attributes, as well as the influence of the policy and regulatory environment, were explored. The national systems with little government funding and elevated government control were rated the lowest. Groupings to measure HE performance are given in Table 88.

Table 88: Groupings to measure HE performance.

Groupings	Attributes
Resources	HE institutions are funded for teaching and research from governments, persons and corporations.
Environment	<ul style="list-style-type: none"> Resources are a necessary condition for excellence in HE, but they are insufficient; The regulatory environment is important for ensuring that resources are used efficiently; Excessive regulation of employment conditions will limit the contributions of academics and the capacity to attract and retain globally competitive talent; Restraints on competition may hinder innovation in teaching methods; A narrow choice of alternative forms of higher education is likely to lower participation rates; and Jamil Salmi (2011) and Philip Altbach (2011) have observed that the best performed national tertiary education systems are the ones in which governments set the broad parameters and monitor performance but allow institutions to operate independently from direct government interference.
Connectivity	The worth of a national HE system is enhanced if it is well connected with the rest of the nation's society and is linked internationally in education and research.
Output	<ul style="list-style-type: none"> Output measures need to cover research, teaching and training. Research performance is measured by publications and their impact; education and training is measured by student throughput, and the national stocks of graduates and researchers; Conceptually, the number of graduates is a better measure of output than the number of students, but data limitations preclude the former measure. But the production of a large number of graduates may waste national resources if they do not meet the demands of the national economy; and The appropriateness of training is measured by the employability of graduates.

Source: (Williams *et al.* 2013, pp. 3-4).

Variables are scored by giving the highest-scoring country 100. Other countries' scores are then calculated as a percentage of 100 (the highest score). Each groupings' result is calculated, and an overall ranking is given to each grouping. Missing data were put at the lower quartile score. The results are presented in Table 89.

Table 89: Ranking under groupings.

Rank	Resources		Environment		Connectivity		Output	
1	Canada	100	Netherlands	100	Austria	100	United States	100
2	Denmark	97	New Zealand	100	Singapore	96	United Kingdom	62
3	Sweden	94	United States	99	Switzerland	96	Canada	60
4	United States	92	Hong Kong	98	Australia	94	Finland	57
5	Norway	92	Poland	98	New Zealand	83	Sweden	57
6	Finland	89	Belgium	98	United Kingdom	82	Denmark	55
7	Switzerland	87	Australia	98	France	77	Australia	54
8	Singapore	82	Finland	97	Belgium	71	Switzerland	54
9	Netherlands	80	Bulgaria	95	Norway	67	Germany	53
10	Ukraine	76	Sweden	94	Sweden	65	Netherlands	51
44	South Africa	35	South Africa	69	South Africa	62	South Africa	19

Source: (Williams 2013, pp. 603-604).

The scope of education and training was gauged according to trained people and adults with a tertiary qualification, while the contribution to the economy was measured by the quantity of researchers per head of the populace (Williams 2013). Using the labour force with a tertiary education as a measure of the performance of the HE sector is an imperceptive measure, as the applicability of the qualifications to the modern economy is not taken into consideration. Unemployment data could be used to measure the appropriateness of education and training (Williams 2013, pp. 605-606). For instance, in Chile, Mexico, and Indonesia, the unemployment rate of people with a tertiary education was higher than that of people with only secondary-school training. The deduction that can be made is that the tertiary education sector is delivering an inappropriate combination of graduates. Even if it is difficult for countries in Africa and Latin America to attain the same levels as high-ranked countries, they can build up a strong HE sector by establishing a promising environment, funding appropriately, and establishing ties with credible research- and training organisations (Williams 2013, p. 608).

The plan devised by the African Union — Action for the Second Decade of Education for Africa (2006–2015) — highlights the significant education challenges faced by Africa. The low contribution of HE in Africa to gross national income can be seen as a result of the low university enrolment rates in sub-Saharan Africa (Gehring *et al.* 2011). Particular challenges for African HE systems include:

- poor infrastructure, such as laboratories without equipment and lecture rooms that are too small;
- a requirement to align the HE system to the international norms for Bachelor's, Master's, and Doctorate degrees;
- gender inequality — women that are under-represented, and are confined to courses in the social sciences, humanities, services, and health sciences;
- research programmes with disjointed and inadequate curricula;
- no culture of evaluation of staff (academics and support staff);
- no collaboration or alliances with other institutions at any level;
- an extreme system of governance in management procedures, together with strikes, which impede institutions' stability and performance; and
- academic research and innovation is not aligned, hampering socio-economic progress

(Urama *et al.* 2010, p. 282).

Dynamic forces involved in achieving educational change is given in Figure 70.

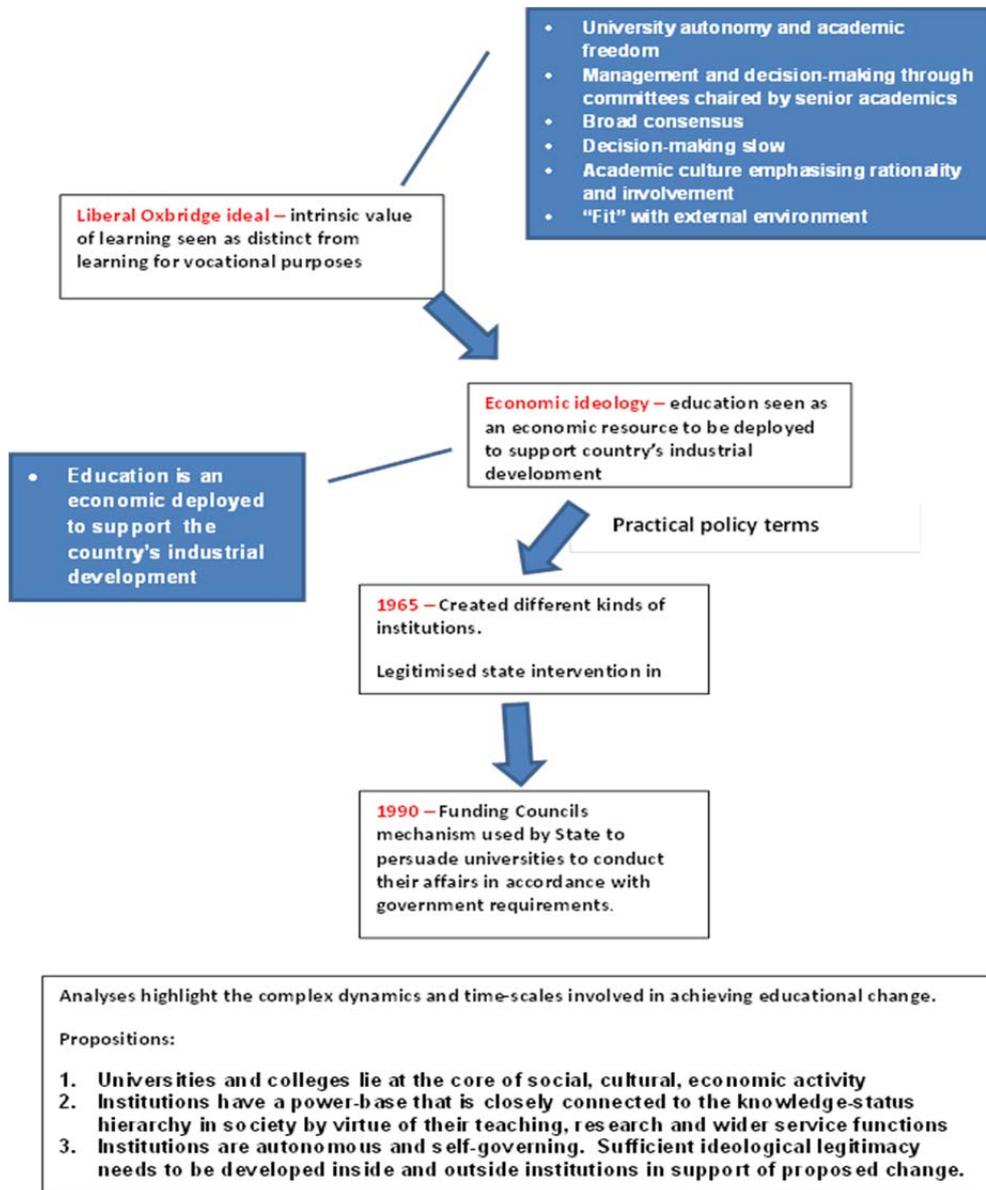


Figure 70: Dynamic forces and time-line involved in achieving educational change.

Source: (Middlehurst 2004, pp. 251-262).

Sociologists advance the knowledge society, while economists advance the knowledge economy, and educators enhance the learning society. Sociologists, economists, and educators do not typically converse in the academic sphere, but they can contribute to

innovation in more progressive knowledge-based civilisations through the transformation of universities. The triple-helix treatise alludes to the increasingly interlaced relationship between the formerly insulated social realms of university, government, and industry (Valimaa & Hoffman 2008, pp. 265-271). For HE to be relevant, it needs to be responsive:

- politically;
- to employment;
- to additional echelons of the education system, in addition to students and teachers;
- to culture and cultures; and
- everywhere, all the times, and to all.

In the knowledge society, universities are important. HE underwrites the worldwide dissemination of knowledge (UNESCO 2005, p. 97) by producing knowledge and learned specialists in industrialised societies in developing countries. According to UNESCO, HEIs are ‘destined to play a fundamental role in knowledge societies based on radical changes in the traditional patterns of knowledge production, diffusion and application.’ The conversation around the knowledge society challenges institutions to explore new, co-operative teaching praxes. Professionals are trained in academia and in work places, which challenges institutions to develop their traditional structures and their pedagogical praxes (Tynjala, Valimaa & Sarja 2003).

HE is becoming competitive, and therefore needs to develop as business institutions (Hynes & Richardson 2007). To withstand the complex markets, they need to be introduced to applicable tools to attend to students’ needs, as well as those of society in general (Drozdova 2008; Ross 2008). One of the priorities in this evolution is attention to innovative HE practices and products, and aligning these to the interests of all stakeholders in HE. In today’s competitive market, potential students have many options, and place a high premium on institutional reputation, physical infra-structure of institution, institutional fees, and employability when making choices. Key attributes of a HE degree are:

- innovativeness;
- pedagogical value;

- usefulness;
- students being able to rely on HE management support;
- financial and technical feasibility; and
- the possibility of a competitive future salary.

(Wolff 2008).

New challenges in education offer prodigious opportunities to call on the imagination to innovate and transform our 20th century educational model. Transformational educational growth and/or change through innovation should be viewed as a strategy. The realisation of such an innovation strategy is accomplished by developing transformational leaders who can cultivate a talent-driven and improvement-driven culture for the future. Such a culture will translate transformational leaders potential into energy, with intrinsic commitment to unleashing passion and performance. Such leaders need to contribute to the successful conception, understanding, and implementation of novel ideas that create value for the organisation, which are critical to the growth and survival of any organisation.

According to the Trends in Global Higher Education report (2008–2009), the characteristics of the global age include:

- academic mobility (internationalisation) of highly trained professionals;
- massification of higher education — reform addresses key factors such as expanding social inclusion (access) and participation;
- the diversity of student cohorts in terms of race and language;
- the impact of outcomes-based education on the education system; and
- the trend to professionalise HE teaching.

These trends have challenged universities to balance local needs and priorities with internationally referenced standards, in order to be internationally competitive.

Customary indicators are socially de-contextualised (Morley 2001) and are not readily accessible to be measured (Holmes 2001), the measuring of the success or failure of educational institutions is complicated by the re-conceptualisation of employability as a

compendium of personal attributes. As the result of government funding regimes, institutions are keen to prove that they are performing well. Institutions started setting learning outcomes, which are measured as either being successful or unsuccessful (Boden & Epstein 2006). Education has been reduced to factual knowledge gain and a collection of technical skills, but not the advancement of the mind. Academics need to achieve their course learning outcomes, but because employability drives pedagogy and curriculum, academics are left with no authority to decide on outcomes or even the micro-politics of their formulation.

6.2 UNIVERSITIES AS HE INSTITUTIONS

Countries are reliant on universities to create a system of human resource development and research-based activities, embedded within institutional autonomy and academic freedom. The value of universities is perceived by some to be learning and development processes, and they are viewed as the main producers of knowledge, both in tangible and intangible forms. As knowledge capital has surpassed the value of physical assets, universities are confronted by demands related to the way they function, as well as how they should function. Universities therefore need to be empowered to raise arduous problems and search for knowledge and insight.

Georges Haddad pointed out (quoted in Neave 2000, p. 29) that the term 'university' originated equally from the legal Latin word 'universitas', meaning 'community,' and the conventional Latin word 'universus', meaning 'totality.' A HE institution is a collection of numerous stakeholders, divided as internal to or external to the institution, scattered around the globe. Internally, there is the community that consists of students, staff, management, and administrative staff, and externally there are graduates, research communities, corporations, social associations, consumer organisations, governments, and professional associations.

Institutions are autonomous and self-governing (Middlehurst 2004, pp. 261-262). The Lambert report (Middlehurst 2005, p. 275) referred to several transforming elements

regarding appropriate internal governance suitable for HE institutions. This complex environment requires multifaceted and differentiated solutions (Clarke 2008 p. 177).

These solutions include:

- a portfolio of diversified funding sources to increase income;
- ascertaining appropriate cost and quality control;
- building an inclusive administrative backbone and shared governance arrangements;
- encouraging innovation;
- extending development boundaries;
- entrepreneurialism in core departments — metrics for success need to be orientated more towards entrepreneurial impact (Laine *et al.* 2008, p. 10);
- maintaining balance between innovation and enterprise, coupled with central steering and an institution-wide entrepreneurial culture; and
- a visionary, process-based leadership style that realises potential (Laine *et al.* 2008, pp. 183-184), not an ordering and directing leadership style (Holden 2001, p. 160).

HE institutions are convoluted (Cardoso 2005), and functioning in exceedingly competitive circumstances (Brenders *et al.* 1999; Hynes & Richardson 2007; Drozdova 2008). They need to convert to a more entrepreneurial style, providing new, more efficient educational services. HEIs have a distinctive and different role to perform in the global knowledge economy by becoming better solvers of local problems, while meeting cultural needs and providing services. Working, learning, and innovating are thought to conflict with each other (Brown & Duguid 1991, p. 40). For the collective prospering of working, learning, and innovation, they need to be linked closely, realistically, and more reflectively, in theory and in practice.

6.3 STUDENTS

Institutions that have taken up the employability agenda need to adapt their graduate attributes, including their abilities, competencies, and aptitudes, as well as their social and cultural capital (Morley 2001). Before the neoliberal reforms, academics were entrusted to decide on their pedagogy and curriculum, with minimum centralised control and regulation. Knowledge and skills were, as a rule, outlined in terms of intelligence,

while the expected results were valued citizens, socially and economically. It was hoped that these citizens would display enquiring minds, with cultural capital.

Graduates find it easier to secure employment and earn more than non-graduates (over the span of their working life, they earn R100 000 more than a non-graduate) (BIS 2009, p. 2). The generation and transformation of knowledge, into social and economic benefits, is a product of HE. Universities need to contribute to economic growth by way of the commercial application of the knowledge they generate and by priming graduates for the knowledge economy (BIS 2009, p. 7). A robust HE system is imperative to the success of a country's economy and the profundity of its intellectual and cultural life (BIS 2009, p. 18).

What are the implications for students and their academic experience? Students seek one of two possible outcomes:

- a degree as a means to an economic end (some graduates expect a financial benefit from their learning journey); or
- being perceived as customers, which would lead to a goal-oriented instead of a process-oriented attitude to their learning. This focus may make students participate less in the wider activities of the institution.

The pedagogical character of institutions should not be limited to educating students; HEIs need to be critical associates in society (Boden & Nedeva 2010).

Knowledge, the most important commodity of the modern economy, is created and transferred by HE. Institutions need to create effective knowledge transfer mechanisms to promote social or economic development, enhance economic competitiveness, and increase the stock of knowledge. An inhibitor of innovation in HE is abundant or squandered resources (Leavy & Sterling 2010, p. 5). Emphasis needs to be on leveraging institutions' resources to increase economic growth by providing the required skills to progressive and competitive economies. The most prominent contrast between industrialised and emerging countries is the obtainability and utilisation of skilled labour that operates with social efficiency. Economic performance is progressively more reliant on the quality of education, skills, innovation, and flexibility (Hanushek & Woessmann,

World Bank 2007, p. 16). Within the learning economy, graduates act as innovators (Lundvall 2008; HE, Innovation, and Economic Development, World Bank 2008, p. 7). In the learning economy, teaching models need to be modified to accentuate inquiry-based learning, using authentic problems from the national reality, including integration of practical experience, to enhance graduate attributes.

6.4 FUNDING OF HIGHER EDUCATION INSTITUTIONS

An essential requirement, articulated in constitutional terms, of an institution's autonomy and academic freedom is the search for wisdom and the perpetuation of the standards on which an educated civilisation hinges (Middlehurst 2004, p. 260). The intention is to ensure orderly procedures, broad consultation, and weighted judgements, as well as a match with the external environment (Middlehurst 2004). The liberal ideal accentuates the innate worth of learning, separate from learning for occupational reasons. The new economic ideology sees education as an economic resource in support of industrial development (Middlehurst 2004, p. 260). This allows government, through funding and quality assurance, to exercise power, as universities are placed at the centre of cultural, social, and economic actions, linked to the knowledge-status pyramid in society.

The Haldane Principle was developed by Richard Burdon Haldane in the early twentieth century. The principle holds that 'government funding of universities should be within institutional arrangements that ensured that it did not exert undue influence on what they did' (Boden & Nedeva 2010). Solutions to expand innovativeness and entrepreneurial actions on all levels include innovative educational solutions, new public private partnerships, new programmes and curricula, innovative learning environments, and pedagogical solutions for and collaborative applications of research. Settings for innovation are sometimes urban locations that are closely linked with global cities. These locations are receptive to the exchange of ideas by people, facilitated by transportation and information technology services that are well organised. The openness and co-location of universities, research institutes, and businesses promote diversity and accelerates the journey from problem solving and discovery to innovation (Laursen 2008).

6.5 HIGHER EDUCATION – LEADERSHIP

In the spirit of change, institutions needed to shift from ‘structure and roles to people and processes,’ and the balance of power between government and the institution also needs to shift. Using Oxbridge University as an ideal example where ‘the pursuit of knowledge is for its own sake’, and the construction and diffusion of knowledge is considered, the position and function of a HE institution, was required by far-reaching governmental agreement. Alternatively, the liberal ideal explored the constitutional position of institutions’ internal operations. The pre-requisites of academic freedom and institutional autonomy should be in place to search for information and preserve the standards of a cultured society. Academic authority was exercised through consensus-driven committees, which resulted in slow decision-making. The consensus approach strived for harmony with a steady and helpful external environment (Middlehurst 2004, pp. 259-260). The belief also made a distinction between ‘intrinsic value of learning’ and ‘learning for vocational purposes. In a quest to create efficiency and consolidate power and responsibility, management decision-making procedures were introduced into the HE sector (Middlehurst 2004, p. 264). These steps were taken to effect change. The evolution of leadership roles in HE is explained in Table 90.

Table 90: Progression of HE leadership roles.

Nature of change	Focus of change	Impact of change (reported)
Structural	<ul style="list-style-type: none"> • Creation of new units and posts • Reduction and refocusing of committee terms of reference and accountability • Corporate governance 	<ul style="list-style-type: none"> • New posts eg. staff training unit • Planning and resources committees created – joint Senate and Council membership • Council as supreme governing body over Senate • Senior management teams emerge
Systems and procedures	<ul style="list-style-type: none"> • Resource allocation methodologies • Planning procedures • Management information systems • Appraisal systems 	<ul style="list-style-type: none"> • From historic to formulaic resource allocation, tighter financial controls and devolution of responsibility for budgets • Auditing processes strengthened • Staff training and development strengthened
Roles and responsibilities	<ul style="list-style-type: none"> • Clarifying executive responsibilities (e.g. VC as CEO & Chief Accounting Officer) • New responsibilities for academic Deans and HoD's • New specialisms emerge (eg Enterprise officers) 	<ul style="list-style-type: none"> • Sharper external accountability • Increased management responsibilities and potential time conflicts with academic roles • Changes in administrator roles Pro-Vice Chancellors take on wide-ranging strategic level portfolios
Patterns of appointment	<ul style="list-style-type: none"> • Selection and appointment processes • Terms of office 	<ul style="list-style-type: none"> • Move from election by colleagues to selection by senior management • From rotating to fixed term • Management and leadership abilities added to professional criteria for promotion
Power and authority	<ul style="list-style-type: none"> • From committees to individual 'executive' responsibility • From academics towards administrators as professional managers 	<ul style="list-style-type: none"> • Tensions perceived between academics and administrative authority • Devolution from centres to academic units begins in many institutions
Training and development	<ul style="list-style-type: none"> • Management and leadership development promoted 	<ul style="list-style-type: none"> • Skills deficits identified • Negative attitudes to 'imposed' management training reported

Source: (Middlehurst 2004, pp. 265-266).

Deem *et al.* (2001) reports that after this period, other changes were effected, such as removing the binary line: polytechnics became universities, student numbers expanded significantly, and management roles were changed into permanent appointments, which became a sign of status and responsibility. The authors continue in stating that positions were advertised externally and available internally as part of the internal promotion processes. In traditional institutions, the role and functions of management were seen as an add-on and an unwanted burden for academics.

Leadership is a process whereby leaders are members of a community of practice (Horner 1997, p. 277). Multi-dimensional leadership is described more in terms of relationships and interdependencies of such relationships, in which functions transform over a period. Fluid organisational dynamics encourage life-long learning and creative reactions at different echelons of the organisation (Dever 1997, p. 62). According to the practices within learning organisations, ideas from internal supporters are essential for the organisation to be profitable.

Leadership in the 21st century is most challenged by business model innovation, such as producing new efficiencies or venturing into adjacent markets. Fear and risk are involved when creating and investigating transformative business models that deliver value (while driving the performance of the current business model). HE has a significant need for business-model innovation (Flanagan 2012, p. 12). HE leaders must forsake old beliefs about innovation. They need to concentrate on creating a manageable and practical environment, where sound innovation theory can safely be applied. Responsibility for structuring such a novel model as a possibility, should be shifted to an independent organisation. Leaders ought to steer their institutions towards the future, while taking care of organisational culture and values. They should recognise their own development through various forms of professional development activities as vital in enabling them to accommodate different learning requirements. Table 91 explains the ABC of leadership.

Table 91: The ABC of leadership.

The ABC of leadership	Explanation
The A stands for academic institution	Academic success is about reputation at different levels such as individual, departmental, discipline as well as institutional levels. Academic success and reputation is linked to revenue.
The B stands for business	Academic success and reputation depends on success of B, recognising an institutions as an enterprise that no longer can depend purely on an effective lobby to increase public funding
The C stands for community	Ability to create an emotional relationship in the meaning of feeling a sense of responsibility, a concern.
To align ABC and create a shared emotion is to focus more on shared values than on the big vision. Values and vision should be closely linked, otherwise the vision will not be fit for purpose – but values tend to be much more about emotion and passion than vision.	

Source: (van Rooijen 2013).

(<http://www.universityworldnews.com/article.php?story=20131112114721190>)

Systematic research (empirical) that describes what leadership structures are connected with departmental efficiency is scarce. Being a HEI's principal requires a vision, tact, astuteness, and tolerance. HE principals lead through co-operation, not control, and should know how to navigate the very complex human maze that is a major institution. The management of academics requires the management of autonomy (Mintzberg 1998, p. 210). It takes special skills to persuade tenured faculty, the most powerful in the institution and who cannot be fired, while also persuading others outside of the institution to contribute to funding the vision. Institutions are expected to maintain quality in their academic work, and to familiarise and adjust to new developments (Asghar 2013).

In HE, leadership is important, and involves which actions leaders ought to avoid. This reflects the concept of professionalism, as an alternative for leadership in HE. The influence of leader conduct, both relationship and task orientated styles, is counteracted in the case where junior staff have an inclination towards professionalism and independence, an academic staff characteristics (Substitutes for leadership theory first developed by Kerr and Jermier in 1978). Leadership leads to a modification of academic effectiveness. Professional employees require little supervision, but need a veiled type of leadership involving 'protection and support,' e.g., paying attention to the relations with key stakeholders responsible for nurturing genuineness and endorsing the department (Mintzberg 1998, p. 143, p. 146). Table 92 gives leadership as learning and doing.

Table 92: Leadership as Learning and Doing.

Leadership as Learning and Doing	Gender, race ethnicity in Leadership	Role-based Leadership
Transcends focus on position and type of organisation. Looks at how leadership is cultivated / shared regardless of role. Key factors in their effectiveness (Ken Kempner's: 2003).	We accept the importance of lived experience in interpreting new information.	Mentors and protégés – these learning relationships affect current and future leaders.
Academic leaders create learning environments including: <ul style="list-style-type: none"> • cultural awareness • acceptance of multiple intelligences & ways of knowing • strategic thinking • engagement • sense of collective identity as collaborators in developing knowledge and active investigators into practice • skilled facilitators 	Need to develop culturally sensitive frameworks to help to understand leaders whose experiences are not easily portrayed within traditional frameworks.	
They lead via partnerships & teams in systems that are web-like.		
Culture of evidence is critical to successful academic leadership		
Concept of intellectual neutral space is an important condition for achieving team goals		
Transformative leadership style (compare to learner-centered education). Focuses on change although new vision must connect to present and past of an organisation (as knowledge must connect to what we already have internalised in order to be understood, embraced, sustained).		
Transformative process is valued-based, dependant on those held dear by the organisation and its members. EG: <ul style="list-style-type: none"> • enhancing student and faculty learning and development • increasing access • generating new knowledge • serving the community • being agents of positive social change in global society 		

Source: (Amey 2006, pp. 55-58).

The amplified demand for innovation, coupled with limited resources has created a climate in which leadership for disruptive innovation is essential. The demands placed on leadership are further complicated by:

- decreasing governmental commitment for funding;
- globalisation;
- new cost considerations;

- consumer affordability; and
- the increased application and reach of digital technology

(Jandris & Bartlett 2012, pp. 2-4).

Jandris and Bartlett (2012, pp. 7-8) continue with six strategies that will be required of leaders to successfully transform HE institutions:

- eliminating barriers — critical to promoting new, autonomous business models that re-imagine HE;
- outlining threats;
- changing the standards by which institutions are ranked;
- adapting the viewpoint relating to degree achievement;
- driving disruptive innovation; and
- framing or reframing the approach to online learning, making it a core delivery system.

HEIs have adopted management structures more in-line with the corporate sector, maintaining ‘a deliberative structure of committees,’ while embracing an executive organisation configuration. Academic and administrative responsibilities were combined for permanent management positions (Middlehurst 2004, pp. 265-266). These internal governance changes are given in Table 93.

Table 93: Changes in internal governance 1988-1990.

Nature of change	Focus	Impact reported
Structural	<ul style="list-style-type: none"> • Creation of new units and posts • Reduction and re-focusing of committee terms of reference and accountability • 'Corporate' Governance 	<ul style="list-style-type: none"> • New posts: Planning Office, Staff Training Unit • Planning and Resources Committees created – joint Senate and Council membership • Council as supreme governing body over Senate • Senior Management Teams emerge
Systems and procedures	<ul style="list-style-type: none"> • Resource allocation methodologies • Planning procedures • Management information systems • Appraisal systems 	<ul style="list-style-type: none"> • From historic to formulaic resource allocation, tighter financial controls and devolution of responsibility for budgets • Auditing processes strengthened • Staff training and development strengthened
Roles and responsibilities	<ul style="list-style-type: none"> • Clarifying executive responsibilities (eg VC as CEO & Chief Accounting Officer) • New responsibilities for academic Deans and HoDs • New specialisms emerge (eg Enterprise Officers) 	<ul style="list-style-type: none"> • Sharper external accountability • Increased management responsibilities and potential time conflicts with academic roles • Changes in administrator roles • Pro-Vice Chancellors take strategic-level portfolios
Patterns of Appointment	<ul style="list-style-type: none"> • Selection and appointment processes • Terms of office 	<ul style="list-style-type: none"> • Move from election by colleagues to selection by senior management • From rotating to fixed term • Management and leadership abilities added to professional criteria for promotion term
Power and authority	<ul style="list-style-type: none"> • From committees to individual 'executive' responsibility • From academics, towards administrators as professional managers 	<ul style="list-style-type: none"> • Tensions perceived between academic and administrative authority • Devolution from centre to academic units begins in many institutions
Training and development	<ul style="list-style-type: none"> • Management and leadership development promoted 	<ul style="list-style-type: none"> • Skills' deficits identified • Negative attitudes to 'imposed' management training reported
Culture	<ul style="list-style-type: none"> • Some systematic attempts to address culture change (enterprise agenda, quality agenda) • Shift from 'administration' to 'management' • Separation of policy development from execution 	<ul style="list-style-type: none"> • Emerging 'managerialism' in universities noted with resentment • Leadership' apparently less controversial for academics than management roles and duties

Source: (Middlehurst 2004, pp. 265-266).

Environments in which HE operates are transforming, while stresses on institutional assets are intensifying, followed by significant financial changes. The pressure on institutions include to:

- optimise effectiveness;
- explore new income sources; and
- increase performance.

Leadership at departmental level is perceived as an important unit of analysis in HEIs. It is seen as an important administrative unit from which resources are provided and the foremost initiator of an organisation's activities related to teaching and research. Not much methodical research (empirical) is available on forms of leadership leading to departmental effectiveness. A small amount of research exhibits how departmental leaders contribute to departmental culture, performance, and a collaborative atmosphere (Gomes & Knowles 1999, p. 81). A link was created between leadership and effectiveness in HE (Bryman 2007), and the leading behavioural aspects related to leadership effectiveness at departmental level are given in Table 94.

Table 94: Principal leadership behaviour.

Leader Behaviour	Main literature
Clear sense of direction / strategic vision	Creswell et al (1990); Harris et al (2004); Bland et al (2005b); Mitchell (1987); Benoit & Graham (2005); Stark et al (2002); Moses & Roe (1990); Trocchia & Andrus (2003); Lorange (1988); Clott & Fjortoft (2000); Bland et al (2005a)
Preparing department arrangements to facilitate the direction set	Knight & Holen (1985); Creswell & Brown (1992); Creswell et al (1990); Stark et al (2002); Lorange (1988); Bland et al (2005a); Lindholm (2003)
Being considerate	Knight & Holen (1985); Brown & Moshavi (2002); Mitchell (1987); Gomes & Knowles (1999); Moses & Roe (1990); Fernandez & Vecchio (1997); Ambrose et al (2005)
Treating academic staff fairly and with integrity	Harris et al (2004); Mitchell (1987); Gomes & Knowles (1999); Murry & Stauffacher (2001); Moses & Roe (1990); Trocchia & Andrus (2003); Ambrose et al (2005)
Being trustworthy and having personal integrity	Creswell et al. (1990); Harris et al (2004); Murry & Stauffacher (2001); Barge & Musambira 1992); Trocchia & Andrus (2003); Ramsden (1998)
Allowing the opportunity to participate in key decisions / encouraging open communication	Creswell et al. (1990); Harris et al (2004); Bland et al (2005b); Mitchell (1987); Murry & Stauffacher (2001); Moses & Roe (1990); Barge & Musambira (1992); Copur (1990); Lorange (1988); Bland et al (2005a); Ramsden (1998)
Communicating well about the direction the department is going	Creswell et al. (1990); Harris et al (2004); Bland et al (2005b); Gordon et al. (1991); Ambrose et al (2005)
Acting as a role model / having credibility	Brown & Moshavi (2002); Creswell et al. (1990); Harris et al (2004); Bland et al (2005a); Creswell & Brown (1992); Benoit & Graham (2005); Stark et al (2002); Gordon et al (1991); Bland et al (2005a)
Creating a positive / collegial work atmosphere in the department (Especially significant in HE)	Mitchell (1987); Benoit & Graham (2005); Gomes & Knowles (1999); Moses & Roe (1990); Trocchia & Andrus (2003); Ambrose et al (2005); Clott & Fjortoft (2000); Johnsrud & Rosser (2002); Bland et al (2005a); Lindholm (2003)

Advancing the department's cause with respect to constituencies internal and external to the university and being proactive in doing so	Creswell <i>et al.</i> (1990); Harris <i>et al</i> (2004); Mitchell (1987); Creswell & Brown (1992); Benoit & Graham (2005); Stark <i>et al</i> (2002); Murry & Stauffacher (2001); Moses & Roe (1990); Trocchia & Andrus (2003); Bland <i>et al</i> (2005a)
Providing feedback on performance	Creswell <i>et al</i> (1990); Harris <i>et al</i> (2004); Bland <i>et al</i> (2005b); Trocchia & Andrus (2003); Ambrose <i>et al</i> (2005)
Providing resources for and adjusting workloads to stimulate scholarship and research	Creswell <i>et al</i> (1990); Bland <i>et al</i> (2005b); Creswell & Brown (1992); Moses & Roe (1990); Ambrose <i>et al</i> (2005); Lindholm (2003); Bland <i>et al</i> (2005a)
Making academic appointments that enhance department's reputations	Snyder <i>et al</i> (1991); Bolton (1996); Bland <i>et al</i> (2005a)

Source. (Bryman 2007, pp. 693-710).

According to Mintzberg (1998, p. 210), management of autonomy is central to the management of the academic. Leadership concerns what leaders should avoid doing. The impact of both relationship- and task-orientated leader behaviour will be nullified if subordinates have a professional orientation and for independence (Substitutes for leadership theory first developed by Kerr and Jermier in 1978). Leadership makes a difference insofar as academic effectiveness is concerned. Leadership by learning to think critically is given in Table 95.

Table 95: Leadership by learning to think critically.

Leadership as Learning and Doing	Gender, race ethnicity in Leadership	Role-based Leadership
Transcends focus on position and type of organisation. Looks at how leadership is cultivated / shared regardless of role. Key factors in their effectiveness (Ken Kempner's: 2003).	We accept the importance of lived experience in interpreting new information.	Mentors and protégés – these learning relationships affect current and future leaders.
Academic leaders create learning environments including: <ul style="list-style-type: none"> • cultural awareness • acceptance of multiple intelligences & ways of knowing • strategic thinking • engagement • sense of collective identity as collaborators in developing knowledge and active investigators into practice • skilled facilitators 	Need to develop culturally sensitive frameworks to help to understand leaders whose experiences are not easily portrayed within traditional frameworks.	
They lead via partnerships & teams in systems that are web-like.		
Culture of evidence is critical to successful academic leadership		
Concept of intellectual neutral space is an important condition for achieving team goals		
Transformative leadership style (compare to learner-centered education). Focuses on change although new vision must connect to present and past of an organisation (as knowledge must connect to what we already have internalised in order to be understood, embraced, sustained).		
Transformative process is valued-based, dependant on those held dear by the organisation and its members. EG: <ul style="list-style-type: none"> • enhancing student and faculty learning and development • increasing access • generating new knowledge • serving the community • being agents of positive social change in global society 		

Source: (Amey 2006, pp. 55-58).

In HE, leadership is a process whereby leaders understand organisational culture and values to steer their institutions. The leaders' personal development relates to their capability to design environments that aid others' learning (Eddy & Van Der Linden 2006).

Leadership in HE is influenced by:

- deteriorating assets of institutions (Johnstone 1999);
- altering demographics of the student population (Hurtado & Dey 1997);
- the introduction of student-centred learning (Barr & Tagg 1995);

- the influence of technology on lecturers (Baldwin 1998); and
- a paradigm change from an industrial age to an information age (Dolence & Norris 1995).

Leadership categories are given in Table 96.

Table 96: Categorisation of Leadership.

Positional, responsibilities, committees, decision making, related to job function, experience, leader within area
Change agent, initiate change, create environment for change
Provide vision, shape direction
Knowledge, personal mastery, expertise, frequently asked or consulted because of expertise, other personal traits
Others see me as a leader, people trust me and/or respect me
Fulfilling mission of the college, working for the good of the organisation
Empower others, advocate for others, provide support, mentor, motivate others, role model, set example
Me-centered, I am successful, I have the ability to make things happen
Teamwork, inclusiveness, collaboration, building consensus
Influence, power, authority, control financial resources
Not a leader, experiencing barriers to being a leader, or too new in the position to be a leader

Source: (Eddy & Van Der Linden 2006, p. 13).

6.6 HE CULTURE

Laine *et al.* (2008, p. 27) posits that HE has to foster a culture where lecturers participate in research projects and collective development projects with industrial partners, and transfer their research results and experiences back to teaching to benefit students. Such projects support multi-disciplinary research. This interaction is depicted in Figure 71.



Figure 71: Internal Interaction Model.

Source: (Laine *et al.* 2008, p. 28).

Middlehurst and Kennie (1995), against the background of an altering association between HE institutions and government, comments that institutions upheld the equivalent arrangements of management, academic policy-making and leadership through a consensus committee arrangement. Movement has been in the direction of academic leadership and management, an abridged committee arrangement on the way to more robust managerial practices, and away from administration.

McNay (1995) postulated four idealised cultures in institutions, co-existing but with different balances. These idealised university cultures are described in Table 97.

Table 97: Idealised cultures in university.

Pre 1992 Universities (traditional universities) – moved from 1 to 2	
1. Collegium	Associated with freedom from external controls and academic autonomy
2. Bureaucracy	Linked to regulation, consistency of treatment, due process and standard operating procedures
Post 1992 Universities (old politechnics) - moved from 1 to 2	
1. Corporation	Associated with power through executive authority with a separation of roles between managers and ‘professionals’
2. Enterprise	Linked to ‘client’ with an emphasis on decision-taking that is located close to the customer

Source: (Middlehurst 2005, p. 266).

6.7 EDUCATIONAL INNOVATION

HE leaders need to contrive and create a genuine platform for transformation, and forsake their long-held ideas regarding innovation. Such a platform needs to be ‘a place where the intractable system that is HE can design and test proposed solutions in a real-world environment’ (Flanagan 2012, p. 12).’ It is critical that the platform embraces autonomy, allowing the institution to engage in different pathways without disturbing its current value network. It will allow for the engagement of HE leaders in sound innovation theory in a harmless, controllable, and real-life environment. Pursuing a hypothetically unruly, novel business model strategy entails anxiety and risk.

Nonetheless, the vital need for business model innovation is nowhere as rife and pertinent as in HE (Flanagan 2012, p. 12). In HE, a contradiction exists between organisational efficiency in processes and governance, and personal productivity, translated as personal intellectual fulfilment or academic freedom. A business model with which to explore a degree of alignment between the two — how the needs of the university (teaching, administration, students, and funds) could be balanced with those of the individual (research, grants, and personal brand) — is needed. This model should value innovation as a strategy, and be able to focus it on value-discipline, such as operational excellence or brand mastery (Treacy & Wiersema 1995). Learning, a fundamental component of the knowledge process, has made conservative educational systems obsolete, and positioned innovation as a dynamic change process in systems reform (Csoka 2009, p. 1663).

Flanagan highlights that institutions need to agree on the value they create within the value chain, and then work with other institutions that have the capability and motivation to try new things. This means not only tweaking the current way of doing things, but attempting appropriate transformational methodologies. Network innovations connect rather than create value. It is extremely difficult to disentangle existing realities from the external environment and then repackage them differently. Therefore, leaders need to embrace the discomfort of how similar things are. The ability of institutions to steer between several disciplines and industries, and to sense conceivable re-combinations of innovation is insufficient (Flanagan 2012, p. 14). HEIs need to ascertain their value contribution in the value chain, be it the offering of a degree (a product) or a service (knowledge, competency, or skill sets), or a social good citizen. Leaders need to step away from reductionist viewpoints that stand in the way of holistic systems thinking, and move beyond functional skill sets (engineering, finance) (Flanagan 2012, p. 14).

Flanagan (2012, p. 18) cites Stefan Thomke, the author of *Experimentation Matters*, who highlighted the necessity to be able to experiment impulsively when innovating. Many institutions follow student-centred transformation efforts, but these efforts fail because of:

- institutional obstacles concerning divisions and specialities;
- disjointed engagement tactics that fail to provide what students need;

- inadequate procedures for innovation;
- a lack of ability to conduct experiments; and
- universal inertia regarding novel answers.

Flanagan further suggests that Institutions should not design a model grounded on a profound perception of the student experience, but preferably involve students in the conceptual development of an entirely innovative educational experience. This will lead to the creation of an experience that is relevant for the students, whilst influencing the knowledge and know-how of all members in the system. Inspiring such a profound level of learning and doing creates a mindfulness of the bigger picture, propelling activities towards sincere business model innovation. In HEIs, the missing link in systemic change is the construction of the correct environment for enduring investigation, culture transformation, and radical student engagement. Participatory design allows everyone to take responsibility for the success of the challenge (Flanagan 2012, p. 18).

Teaching and research engage academics in creative knowledge work. Research is mainly an individual activity, and academic loyalty is oriented towards an academic unit or discipline. New public management elements, such as the management of performance, teaching, and research, quality assurance, performance indicators, and targets lean towards greater accountability of academics towards their public paymasters (Deem 2004, pp. 107-108). HE is growing as a consequence of mounting demand for qualified specialists and governments' agenda for increased access and educational quality. With increased competition and globalisation, HE seeks to survive through innovation (Mok 2003). Universities need to create environments that promote creative processes and stimulate creative thinking. According to Findlow (2008), several forms of promoting innovation in HE can be considered:

- research development;
- changing traditional teaching methods;
- management innovation;
- the use of ICTs in the teaching process; and
- offering new relevant curriculums.

Learning should not be strictly classroom-based, but should also include experiential learning. Mass education's most dominant challenge is that the diversity of students (potential, needs, talents, and limitations) needs to be accommodated.

Innovation in services (new services, transformation in procedures to render a service, novel configurations of supervision and organisations, changes in the market, or *ad hoc* innovation) is organised informally, and is more incremental and less technological (Oslo Manual OECD 2005). Global tendencies position services innovation at the centre of institutions' effectiveness, where it is seen as a means of continuously investing in new offerings (Stevens & Dimitriadis 2005). Studies made general contributions to the formation of a prototype to create novel services for innovation in HE, emphasising that a formalised procedure needs to be followed to increase the innovative services' success (Stevens & Dimitriadis 2005).

Quality teaching in HE is a 'contested concept' (Skelton 2004, p. 452) with many different definitions. To ensure quality in teaching and learning at university level, a shared understanding of what is meant by being an effective academic is needed (Devlin & Samarawickrema 2010, p. 111). In conceptualising this shared understanding, emphasis is placed on student learning, encapsulating future needs, and the lecturers' teaching, emphasising both knowledge and presentation. The societal, political, economic, technological, and demographic complexity context influences effectiveness in teaching and, ultimately, teaching quality. The complexity of the HE system is further convoluted by these entwined forces emanating from many different sources. Continuously changing challenges are posed by other contextual factors, including expectations related to professional and accreditation bodies and demand for skills and attributes, which need to be managed to ensure quality teaching. This challenge lends itself to the adoption of innovative practices and processes for academics to survive (Devlin & Samarawickrema 2010, pp. 119-120). Suggested specific aspects in a global society that educational leaders must have knowledge about to establish and sustain relevant and useful educational experiences for students are knowledge about:

- political literacy;
- economics;

- culture;
- morality;
- pedagogy;
- information;
- organisational; and
- spiritual and religious.

Leadership in innovative organisations tend to have fewer formal structures, but gives cohesive direction to follow.

6.8 PUBLIC HE CONTEXT (SA)

From a global perspective, considering the knowledge economy, HE in SA plays a pivotal role in national development. 'Prima facie, indicators such as shortages of high-level skills and the concurrent incidence of graduate unemployment suggest that there is a significant mismatch between the output of the sector and the needs of the economy' (A Case for Improving Teaching and Learning in South African Higher Education, HE Monitor No. 6, 2007, p. vii) Recent data (A proposal for undergraduate curriculum reform in South Africa: The case for a flexible curriculum structure from the CHE, 2013) highlight alarmingly low levels of performance in this sector. Transformation is rooted in change that is steered by knowledge, leading to improved effectiveness of teaching and learning in HE.

The global dominant trends identified by UP that influences its strategy are summarised in the UP Strategic Plan 2025, given in Table 98.

Table 98: The global foremost trends identified by UP.

Global – dominant trends		
Socio-political trends	Economy & demographics	Higher education
Multi-polarity and the rise of the global South Search for energy, food and water security Resource constrained world Proliferation of social and political identities, with religion an important marker of identity Peace and security challenges Gender empowerment changing the geopolitical landscape	The world has become 'flat' due to the ICT revolution, with knowledge freely available World recession with economic growth concentrated in the South Youth bulge in the South (excluding China) Rapid urbanisation in developing world Migration and mobility – skills loss for the South, especially Africa Access to natural resources focused on Africa	Increased participation and diversity/ massification of higher education (HE) Universities ranked – increasing competitiveness Knowledge economy and 'networking' society ICT as tool for research and 'blended' modes of teaching, and in building strategic networks Differentiated higher education sectors Knowledge capacity demands and knowledge divides – nationally, regionally and internationally Internationalisation of HE Open education resources (OER) as 'public good' and a tool for increased institutional visibility

Source: (UP Strategic Plan 2025, p. 4).

Developments on the global level prompt dynamics at a local level, and local recommendations create the variations in the systems at a higher order. At the global level, the selection of markets and innovative dynamics provide different communication codes, while local conversions at the interfaces suggest variations in institutional arrangements.

The global market affects academics' innovation adoption in relation to the following:

- the curricula of programmes presented need to create work opportunities and contribute to the quality of education;
- research topics need to be informed by a global perspective, with local relevance;
- research outputs are internationally peer-reviewed, and needs to be on an international standard to gain recognition;
- UP has centres of excellence that need to remain internationally recognised;
- external funding is sought in support of students, such as through Master-card and the Dell foundation;
- exchange programmes for staff as part of academic staff development;
- exchange programmes for students for experiential learning;
- enrolment of international students;

- international accreditation for academic programmes;
- IT development, with a focus on educational technology allowing for co-operation and research globally; and
- UP competes internationally for a ranking.

The UP strategy speaks to challenges and opportunities for academics on a global platform. These challenges question the prisms through which academics approach their work, and hold the possibility of innovation. The challenge is to be relevant in the rather complex South African society. In moderation, innovation is, to some, a mind-set and, in that sense, some people will always look for something interesting, new, or original, and test new ways to see if these are more effective or have more impact. These concepts need to be explored more in the institution, and be nurtured by investing in UP talent.

Some faculties/departments are responsive to the impact of globalisation on the academic disciplines and the teaching thereof. Innovation is a very important component of their strategic plan. Academics are also responsible for keeping up with global trends by attending international conferences and interacting with global role players.

6.8.1 South African political layer

SA is an effective two-party system. The African National Congress (ANC) has dominance in the political arena, while the Democratic Alliance (DA) is the official opposition. SA is ruled by a Constitution and the Bill of Rights embedded in it. In SA, the most significant rule is the right to equality. The Constitution also provides a number of socio-economic rights. These provide the majority of the poor with specific mechanisms to demand socio-economic change (e.g., the right to education). The constitution necessitates the state to espouse 'reasonable legislative and other measures within its available resources to achieve the progressive realisation of these rights.' There is a contradiction between the generous number of rights and freedoms and the poverty and deprived circumstances of so many people in SA. This contradiction suggests a country primed for radical change. Mechanisms to bring about change include: the electoral system, courts, Chapter 9 institutions (the public protector, the SA Human rights

commission, the Auditor General), political parties, public protests, as well as the media and civil society.

Public policy is made or influenced by two parties: government (the ANC) and the ANC political party. Government has pursued three policy frameworks simultaneously, emphasising different ones at different times:

- the developmental policy thread seeks to meet the demands of those who are poorly educated, not active in the labour market, and dependent on welfare;
- the growth policy thread seeks to stimulate the economic growth, investment, and tax revenues needed to implement the policies of government; and
- the interventionist policy thread seeks to direct investment and business activity towards government's developmental goals.

Economic growth is a key factor in any society, and it determines the extent of opportunities created and tax revenue for distribution by the state in the form of welfare and services. SA's economic growth is about half of that of other BRICS countries, and, in 2013, one of the five slowest-growing economies in Africa. Some structural impediments to economic growth are a low savings rate in relation to the GDP, which impedes capital formation and, therefore, productive investments. A savings rate close to 25% of the GDP is needed. In 1994, savings constituted 16.8% of the GDP; in 2010, it was 16.4% below that of Brazil (22%) and China (52%); high levels of household debt, as percentage of disposable income was 57% in 1994, 82% in 2008, and 76% in 2012, attracting less FDI than other developing countries (IRR South Africa Survey 2012, pp. 132-133). In 2012, it was only 6% of fixed investment, while Brazil attracted 15% and Russia attracted 12%. The budget deficit was 5.5% of the GDP (2010). In 2013, it was still close to 5% higher than that of Brazil (2.7%), China (2%), and Russia (0.5%). This is a reflection of how government is struggling to fund its policies, and leaves little room for increased government expenditure. Economic growth is further hindered by the quality and availability of skills, poor infrastructure, electricity supply, and the low levels of entrepreneurship. In 2009, only 1.4% of South Africans aged 15-64 owned established businesses, compared to 13.5% in Brazil, 2.3% in Russia, and 17.2% in China. In 2010,

new business ownership in SA was a quarter of the figure for Brazil and half of the figure for China (IRR South Africa Survey 2013, p. 205).

Only 2% of the adult population pays more than 50% of the income tax. This is used to pay 15 million social grants that support 50% of South African households. Employed South Africans increased from 12.5 to 13.1 million from 2001 to 2011. Job creation is a major priority — this places economic growth at the centre of the social equation, as growth is needed to create jobs. The reason for the high unemployment rate is that the structure of the economy has changed over the past six decades, moving towards relatively high-tech industries and high skilled professions (IRR South Africa Survey 2013, p. 205).

The GCI (pp. 32-33) points to a need for improvement in innovation in the country. To enable innovation, government needs to commit to funding and support for innovators. Policy should create an environment conducive to new entrants and business on a global level. The HE budgets should allow for the massification (increased access) in HE enrolments, to address the skills development need in the country. This is currently not the case, and institutions are struggling to meet their operational budgets. As academics are also sourced from other countries according to their expertise, and students from other countries can enrol at UP, visa processing is currently posing issues. The tri-part alliance between government and labour impedes labour market productivity. Protectionism and labour disputes lead to a loss of international investment. Government needs to enable competitive communication infrastructure and Internet connections. An important role of government is to ensure quality schooling, allowing for the transition of matriculants into HE. The focus of schooling leading to citizenship, as well as poor teacher training, hampers enrolment into HE, which requires good academic preparation (Cronje 2014).

Political trends are largely a product of the economic environment, which is discussed next.

6.8.2 SA economic layer

The financial inflows to enable economic growth, trade, and development and private investment from the rest of the world moved to perceived safer havens, leading to a reduction in growth and an upsurge in unemployment. The reduction in demand further reduced economic growth through the drying up of the private inflows conduit (the value of 0.5% of growth is equal to approximately \$5 billion in lost output), demand for exports, and reduced trade credit (Naude 2009, pp. 4-7). As a consequence of the economic crisis, it was pivotal to SA's efforts to retain and increase employment. According to the framework, an essential part of all sector revival agendas is to focus on developing skills and promote high-level competences.

The external environment of UP is extremely complex, and there are a myriad events and stakeholders that influence the operational efficiency of UP. The complexities underpinning the political, social, and economic environments are constantly changing, and, in many instances, this happens in conflicting ways. These complexities have a direct bearing on how business is done in the institution but it is impossible to identify each of them and gauge the likely impact of their activities.

National and international investors were influenced as international rating agencies downgraded (Moody's 2014) the economy and cited the risk of populist pressure undermining sound fiscal policy. Between 2006 and 2012, private business investment lessened to between R220 and R250 billion per year, while government investment increased by almost 100%. Between 2008 and 2012, foreign investors' contribution to fixed investment declined from 14.3% to 6.1%. The new growth path, favouring a 'state-led growth path' for developing a 'developmental state,' conflicts with the national development plan, which envisages a 'private sector investment-led' growth model, and leads to contradictory economic policy. This has paralyzed government and led to a slow-down in economic growth and investment.

Unemployment levels (24.3% Q4-2014) (Stats SA 2014) are unacceptably high compared to other BRICS partners, who have the following unemployment levels: Brazil — 6%,

Russia — 8%, India — 11%, and China — 6%. Of the black youth in SA between the ages of 15 and 24 years, more than 50% are unemployed. In 2013, labour market participation was 50% for women and 62% for men. When comparing these percentages to the period when the BRIC partners included Argentina (Brazil was not available), the figures were as follows (men plus woman): Argentina —78%, Russia — 75%, India — 83%, and China — 82%. This is closely linked to poverty. In 2012, 36% of South Africans lived in poverty (42% blacks and 0.8% whites). As a result, very few citizens are taxpayers (6 million out of a population of 49.5 million, including 32.3 million adults and 13.1 million employed people — of the 6 million, 40% earned less than R120 000 per annum, and 90% earned less than R400 000 per annum). The Gini coefficient (which measures inequality) was 0.631% in 2009, making SA one of the most unequal societies in the world compared to BRICS partners, whose Gini coefficients were as follows: Brazil — 0.547%, Russia — 0.401%, India — 0.334%, and China — 0.425%. Labour unrest has also affected the SA economy. In the first quarter of 2013, the country's GDP growth fell to 0.6% from 3.2%, and to 0.8% in the second quarter. The annual growth forecast for 2013 and 2014 fell to 2% and 1.8% respectively, from 3% in 2010 and 2.5% in 2011 (IRR South Africa Survey 2012, pp. 132-133).

The economic environment has a major influence on the social environment, which determines health, life expectancy, living standards, and levels of education. Life expectancy in SA fell to 51 years in 2010, from 66 years in 1995. Other BRICS countries' life expectancies are as follows: Brazil — 73, Russia — 69, India — 64, and China — 73. In SA, very few people are well educated. In 2012, 39% of adults had completed their school education, and 6.5% had a tertiary education. Studies have shown that education standards in SA lag behind those of its BRICS partners, while the WEF ranked the quality of schooling in SA at 146th out of 148 countries. Blacks in higher education have doubled from 286 000 in 1995 to 640 000 in 2013. In 2012, only 4.1% of blacks older than 20 had a tertiary education, as opposed to 25% of whites, while 39% of senior managers were black. A small black middle class has risen to 10% of blacks (60%-70% of whites fall in the middle class). The social environment is characterised by very high levels of violent crime, and higher levels of personal safety are being demanded. In 2008, the BRICS

countries recorded murder rates per 100 000 people as follows: Brazil — 22, Russia — 14.1, India — 2.8, and China — 5.8, while SA's was 36.5, which has since declined to 31.

The social and economic environments divide SA's people into two prominent groups:

- a small group (10% of the population) with a middle-class lifestyle and good qualifications; they have good jobs, and spend relatively large amounts of money; and
- a large poor group, poorly educated and dependant on welfare and service delivery funded by a minority of taxpayers. Welfare has become the most important source of income as employment for black households (welfare beneficiaries increased from 3.5 million in 2011 to 16 million in 2012).

The academics questioned during the present study are indirectly influenced by the external economic factors, while the institution as a whole is more directly influenced. Graduates (alumni) already active in the economic environment contribute financially to the institution, as well as to the rating of the institution. The product that academics deliver (graduates) needs to engage in this environment; therefore, their inputs in delivering this product need to be aligned with the economic needs of the country, while also speaking to the epistemology of the discipline. Developing the needed skills can alleviate the unemployment in the country, and could contribute more tax income and economic growth.

Current economic factors are conducive to innovation. SA needs to attract foreign investment by creating an environment endorsed by international rating agencies. Through more foreign investment, jobs can be created, addressing the high unemployment rate and talking to the deficit on the trade balance. The responsibility of HE is to develop the skills needed in the country, and to develop the entrepreneurial orientation in graduates, so that they will also contribute to creating employment in the right industries, which will then also address the expectations of the large poor group in SA. Students with appropriate knowledge can also find employment internationally.

Innovation initiated by HE and skilled graduates in SA is sought to:

- enhance the efficiency and sophistication of businesses;

- create new and innovative businesses, exploring the use of ICTs; and
- alleviate unemployment.

Forging partnerships between business and HE can induce innovation, and also lead to funding opportunities for HE institutions and internship possibilities for students. Labour unrest has made countries hesitant to invest in SA, and they are seeking other, more stable markets. Student debt is exceptionally high, and puts a lot of strain on HE institutions by restricting their operational budget. The South African government student loan and bursary scheme (NASFAS 2014), that provides loans and bursaries to students at all 25 public universities and 50 public TVET colleges throughout SA, had a budget for 2014 of over R9,7 billion for more than 430 000 students.

South Africa is experiencing an electricity shortage, leading to interruptions in the supply of power. The load-shedding practice in SA has resulted in students not being able to access their coursework on the Learning Management System (LMS), which affects their entire learning experience. The cost of running generators to be able to deliver a service (classes) to students on a daily basis has placed more strain on the operations budget.

The economic and social environments exist in conjunction with the political environment. The next section will discuss the social environment.

6.8.3 SA social environment

The economic environment influences the social environment. The social environment determines views and attitudes of members of the public. The political pressures brought to bear on economic policy-makers include:

- inequality between people in relation to health, life expectancy, living standards and levels of education;
- failures of the public education system, leading to failures in the labour market. In 2010, there were 1 million pupils in grade 10; in 2012, there were 511 000 in Grade 12 (matric), of which 377 829 passed the final exams; only 136 047 passed Grade 12 with results sufficient to be admitted to university;

- of the 1 million pupils in Grade 10 in 2010, only a quarter took Mathematics in Grade 12 (2012), and just over 50 000 (5%) passed;
 - race was an important determinant. In 2010, 57% of whites between the ages of 20 and 24 years were enrolled in HE, compared to 14% of blacks. In 2012, 851 000 whites (25%) had a tertiary education, while 992 000 blacks (4%) had a tertiary qualification; and
 - welfare has improved the standard of living at the cost of independence.
- (IRR South Africa Survey 2013, p. 515).

Local challenges and imperatives as identified in the UP Strategic Plan 2025 are given in Table 99.

Table 99: Particular challenges and imperatives identified by UP.

Local — particular challenges and imperatives		
Socio-political trends	Economy & demographics	Higher Education
Weak state/ public sector capacity – importance of partnerships with industry, government and civil society Inadequacy of social and physical infrastructure Persisting social and economic inequalities South Africa as gateway into Africa and partner in global South (e.g. BRICS)	A relatively stable economy and good infrastructure in some areas, but: High-level skills needs and shortages High unemployment, particularly amongst 18-24 year olds Population growth and youth bulge High levels of poverty and inequality Rapid urbanisation Large disparities in the quality of basic education and significant education backlogs Competing national priorities (e.g. health, social welfare)	Pressure for increasing access and levels of institutional transformation Weak pipeline of entry level students Need for resource-rich learning environments and academic development Decreasing <i>per capita</i> state subsidies Increasing state regulation Differentiated HE sector Aging researcher cohort and need to replenish high-level skills/ human capital Knowledge divides and need to increase knowledge capacity The impact of the internationalisation on institutional strategies Multiple demands on HE to contribute/ 'make a difference' Weak international rankings

Source: (UP Strategic Plan 2025, p. 4).

Research by and curricula of HE institutions also need to address social issues. Students can receive experiential training in communities as part of the community engagement responsibilities. Social media is ubiquitous, and needs to be embraced in HE, not perceived as moral decline. The inter-generational divide (seeing things through a different prism than that of students) and asymmetry of resources, especially digital

resources, create challenges that can only be addressed in innovative ways. Expectations have been created in certain schools (especially private schools) regarding the use of technology (tablets), and HE needs to consider these expectations. HE research needs to be aligned with social problems and environmental issues, and deliver more civic-minded global citizens who can deal with intricate challenges.

HE is systemically influenced by the factors mentioned in the discussion on political, economic, and social environments. This interplay is explored next. Creativity through innovation has impacted on and contributed to social change, and demands a social policy. The past decade has pressurised HE institutions to develop into institutions that are more responsive to the country's economic and social development requirements. South African HE policy has a twofold obligation:

- to address challenges of competitive assimilation in the global knowledge economy; and
- to play a part in neutral national economic and social development.

These pressures pose severe and complicated challenges to academics, and need to be addressed through expansive conceptions of innovation (Kruss 2006, p. 320, p. 344).

It is critical to know where and how innovation originates, and how the adoption of innovation can be nurtured. HE is perceived as the vehicle to prepare the youth of the country with capabilities and a disposition to successfully engage in the labour market.

6.9 INCOME SOURCES OF PUBLIC HE

The flow of funds to public universities in SA is summarised in Figure 72.

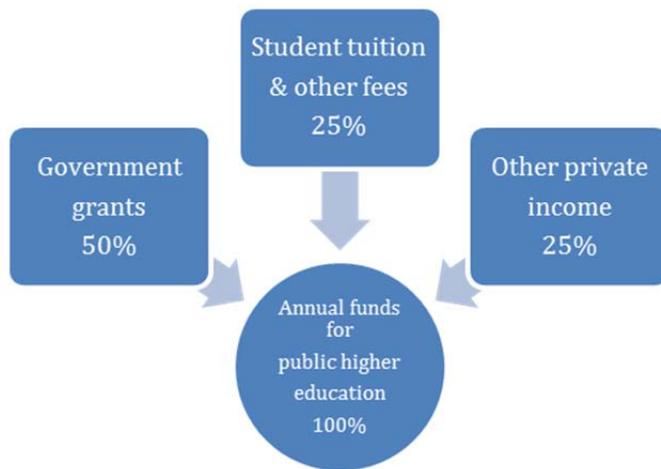


Figure 72: Sources of funds for public higher education institutions.

Source: (Ministerial statement on University Funding: 2015/16 AND 2016/17, 2014 <http://www.dhet.gov.za>).

Government grants to public HEIs is regulated by the Ministry of Education. The diagram in Figure 72 reflects average proportions for the whole system, which can significantly differ between universities. For instance, if an institution can solicit large amounts of private funds (through research contracts, donations, and investments) it can receive as little as 35% of the government grant. If it is not able to, it can receive as much as 65% from government.

Government grants are awarded to public institutions as stipulated in the new funding framework. This framework is linked to national and institutional planning, in accordance with national policies. Government expresses some of its policies through HE, such as transformation. According to the HE and Training Minister, Blade Nzimande, the pace of transformation in universities in SA is too slow (Friday 16 January at the Education Alliance meeting at the University of Johannesburg). His focus was particularly on the University of Stellenbosch, North–West University, and UP. When fully implemented, the recently tabled Staffing South Africa’s Universities Framework (SSAUF, <http://www.dhet.gov.za>) is predicted to aid transformation by addressing South African universities’ staffing challenges, including those associated with the transformation of the staff profile.

The HE and Training Minister, Blade Nzimande, also noted that technical and vocational education and training (TVET), as well as college lecturer training and development, has not received enough attention. It was emphasised that universities have to play a much stronger role in the development of teachers for the post-school education and training college sector, and to conduct research and knowledge development for these sectors (SSAUF, <http://www.dhet.gov.za>). This is vital, given the need to substantially grow these sectors and enable wider and more appropriate education opportunities in the country. He pointed out that the department recently produced a series of teacher education qualification policies focused on schoolteachers, TVET lecturers, and community education and training centre lecturers and educators. These new policies are meant to contribute to the quality imperative by setting minimum standards for teacher education qualifications, and through the foregrounding of teacher knowledge and practice.

6.10 HE WORLD RANKINGS

International rankings allow institutions to create all-inclusive institutional profiles, to assist in identifying their strengths and weaknesses. The profiles also measure, validate, and quantify execution and approaches across several indicators. However, there is no definitive table depicting such world rankings. The value of the differing tables, with divergent outcomes, lies in their interpretation. The rankings differ in how they collect data, following different methodologies. World ranking Agency's are given in Table 100.

Table 100: World ranking Agency's.

Academic Ranking of World Universities (ARWU)	Times Higher Education of World University Ranking (THE)	QS World University Rankings (QS-WUR)	Webometrics	Leiden
Nobel/Fields Medal Alumni, 10%	Teaching and learning environment, 30%	Academic Peer Review, 40%	Size, 16.8%	Average number of citations of the publications of a university
Nobel/Fields Medal Winner, 20%	Research volume, income and reputation, 30%	Employer Review, 10%	Visibility, 50%	Average number of citations, normalized for field differences and publication year.
Highly Cited Researcher, 20%	Citations, Per Paper, 30%	Student Staff Ratio, 20%	Rich Files, 16.8%	Proportion of the publications belonging to the top 10% most frequently cited.
Nature/Science Articles, 20%	Int'l Staff and Student, 7.5%	Int'l Staff, 5%	Scholar, 16.8%	Proportion of the publications of a university that have been co-authored with other organisations.
SCI/SSCI/A & HCI Articles, 20%	Research Income from Industry, 2.5%	Int'l Student, 5%		
Per Capita Performance, 10%		Citations Per Faculty, 20%		
Academic Ranking of World Universities (ARWU)	Times Higher Education of World University Ranking (THE)	QS World University Rankings (QS-WUR)	Webometrics	Leiden
Nobel/Fields Medal Alumni, 10%	Teaching and learning environment, 30%	Academic Peer Review, 40%	Size, 16.8%	Average number of citations of the publications of a university
Nobel/Fields Medal Winner, 20%	Research volume, income and reputation, 30%	Employer Review, 10%	Visibility, 50%	Average number of citations, normalized for field differences and publication year.
Highly Cited Researcher, 20%	Citations, Per Paper, 30%	Student Staff Ratio, 20%	Rich Files, 16.8%	Proportion of the publications belonging to the top 10% most frequently cited.
Nature/Science Articles, 20%	Int'l Staff and Student, 7.5%	Int'l Staff, 5%	Scholar, 16.8%	Proportion of the publications of a university that have been co-authored with other organisations.
SCI/SSCI/A and HCI Articles, 20%	Research Income from Industry, 2.5%	Int'l Student, 5%		
Per Capita Performance, 10%		Citations Per Faculty, 20%		

Source: (Burton 2015, slide 27).

The rankings list the best global universities judged across all of their core missions - teaching, research, knowledge transfer and international outlook. The rankings utilise 13 calibrated performance indicators to provide a comprehensive and balanced comparison. These rankings are used by HEIs as a strategic tool to promote institutional development. Generally, the uses of rankings fall into four main categories for:

- information for both internal and external communication to prospective students as the primary target group, as well as other stakeholders. In addition rankings provide vital information regarding ones' own institution as well as peer institutions for developing international partnerships;
- benchmarking of ideas and to consider means of improvement;
- to make informed decisions; and
- use the ranking of their institution in marketing material and actions.

The Times HE BRICS and emerging markets rankings are produced by taking into account 13 performance indicators to provide comparisons that are inclusive and unbiased. The method used is similar to that used in the global Times HE World University Rankings, offering year-on-year comparisons based on true performance. These 13 performance indicators are categorised into five areas:

- 30% for teaching (learning environment);
- 30% for research (volume, income, and reputation);
- 30% for citations (research influence);
- 2.5% for industry income (innovation); and
- 7.5% for international outlook from staff, students, and research.

Table 101: Top 10 universities in BRICS and emerging markets for 2015.

Ranking	University	Country	Score
1	Peking University	China	67.7
2	Tsinghua University	China	67.2
3	Middle East Technical University	Turkey	52.5
4	University of Cape Town	South Africa	52.4
5	Lomonosov Moscow State University	Russian Federation	50
6	National Taiwan University	Taiwan	48.5

7	Boğaziçi University	Turkey	46.3
8	Istanbul Technical University	Turkey	44.9
9	Fudan University	China	44.8
10	University of Sao Paulo	Brazil	44

Source: (Times Higher Education BRICS and Emerging Markets rankings).
 (<https://www.timeshighereducation.co.uk/world-university-rankings/2014/brics-and-emerging-economies#/sort/0/direction/asc>)

Table 102: Top South African universities, 2015.

Ranking	University	Province	Score
4	University of Cape Town	Western Cape	52.4
14	University of the Witwatersrand	Gauteng	42.8
17	Stellenbosch University	Western Cape	41.7
47	University of Kwa-Zulu Natal	Kwa-Zulu Natal	31.1
77	University of Pretoria	Gauteng	25.5

Source: (Times Higher Education BRICS and Emerging Markets rankings).
<https://www.timeshighereducation.co.uk/world-university-rankings/2014/brics-and-emerging-economies#/sort/0/direction/asc>

The Center for World University Rankings (CWUR) ranks Harvard University as the best in the world (CWUR 2015 - World University Rankings, <http://cwur.org/2015/>). This ranking uses a number of criteria, including quality of education, alumni employment, quality of faculty, publications, influence, citations, broad impact, and patents. CWUR claims to provide the only global university ranking system that measures the quality of education and training of students, as well as the prestige of the faculty members and the quality of their research, without relying on surveys and university data submissions. The indicators and weighting used to calculate final scores are:

- 25% for quality of education;
- 25% for alumni employment;
- 25% for quality of faculty;
- 5% for publications;

- 5% for influence;
- 5% for citations;
- 5% for broad impact; and
- 5% for patents.

The ratings of the top 10 universities in the world, according to the CWUR, are given in Table 103.

Table 103: CWUR list of the top 10 universities in 2013.

World Rank	Institution	Country/Region	National Rank	Quality of Education	Alumni Employment	Quality of Faculty	Publications	Influence	Citations	Broad Impact	Patents	Score
1	Harvard University	USA	1	1	1	1	1	1	1	1	3	100
2	Stanford University	USA	2	9	2	4	5	3	3	4	10	98.66
3	Massachusetts Institute of Technology	USA	3	3	11	2	15	2	2	2	1	97.54
4	University of Cambridge	United Kingdom	1	2	10	5	11	6	12	13	48	96.81
5	University of Oxford	United Kingdom	2	7	13	10	7	12	7	9	15	96.46
6	Columbia University	USA	4	13	6	9	13	13	11	12	4	96.14
7	University of California, Berkeley	USA	5	5	21	6	10	4	4	7	29	92.25
8	University of Chicago	USA	6	11	14	8	17	16	12	22	141	90.70
9	Princeton University	USA	7	4	15	3	72	25	24	33	225	89.42
10	Cornell University	USA	8	12	18	14	24	15	25	22	11	86.79

South African Institutions.

World Rank	Institution	Country/Region	National Rank	Quality of Education	Alumni Employment	Quality of Faculty	Publications	Influence	Citations	Broad Impact	Patents	Score
149	University of the Witwatersrand	South Africa	1	61	32	172	442	237	321	447	291	48.75
248	University of Cape Town	South Africa	2	104	126	146	319	236	234	265	268	46.58
306	Stellenbosch University	South Africa	3	367+	66	218+	520	503	321	486	219	45.92
478	University of KwaZulu-Natal	South Africa	4	367+	148	218+	562	397	368	579	539	44.85
678	University of Pretoria	South Africa	5	367+	262	218+	620	513	511	741	604	44.39

Source: (Center for World University Rankings 2015).

(<http://cwur.org/2015>).

6.11 SA GRADUATE OUTPUT

SA National cohort studies suggest disturbingly low levels of student performance (graduation rates in the minimum time) in the HE sector. HE needs to navigate an unprecedented series of threats, challenges, and opportunities, while being accountable for their inability to control costs, their inadequate graduation rates, and the lack of preparedness of their graduates for the knowledge economy. Shortages of high-level skills and graduate unemployment suggest a significant mismatch between the HE sector's output and the national needs of the economy. Competition for talent has become more intensified and more global, while there has also been a shift from quantitative to qualitative competencies (CHE 2013).

Major shortcomings have been identified in the graduate output in relation to overall numbers, equity, as well as the proportion of the student body that is successful. These failures are reflected in the following statistics:

- one in four contact students graduate in regulation time;
- 35% of total intake and 48% of contact students graduate in five years;
- 55% of intake for whom allowance has been made to take longer than five years never graduate;
- less than 5% of black and coloured youths successfully graduate.

These patterns in the performance of HE influence the needs to be addressed in the most efficient, equitable, and cost-effective way to enable systemic change in the sector.

Planning within HEIs needs to steer institutions to be more responsive, while taking into account severe financial constraints. This puts pressure on academics, as the strategic plans of institutions are not aligned with the realities of academics, and are therefore not always achievable. Communication between academics and management is not always clear. Curricula comprise crucial transitions for which students are differently equipped, and need to be augmented to meet present-day local and global circumstances. Graduates also need attributes in addition to the knowledge they receive in the formal curricula.

These factors have to be dealt with constructively, as they are systemic obstacles that influence the adoption of innovation by academics.

The South African HE landscape is summarised in Table 104. It is important to understand the number of HEI's in relation to the number of students in the system, undergraduate and postgraduate, and those that have graduated.

Table 104: The South African HE landscape.

<p>The South African higher education system includes 23 public higher education institutions:</p> <ul style="list-style-type: none"> • 11 universities • 6 comprehensive universities • 6 universities of technology <p>As of 03 January 2012, there were also 88 registered and 27 provisionally registered private higher education institutions.*</p> <p>In 2010**:</p> <ul style="list-style-type: none"> • the public higher education institutions employed 46 579 academic staff and 127 969 staff in total • the public higher education institutions enrolled: <ul style="list-style-type: none"> ○ 892 936 students in total ○ 726 882 undergraduate students ○ 138 610 postgraduate students • the public higher education institutions awarded: <ul style="list-style-type: none"> ○ 153 741 qualifications at all levels ○ 41 724 qualifications in business and commerce ○ 37 405 qualifications in science and technology ○ 74 612 qualifications in the human and social sciences • the public higher education institutions produced: <ul style="list-style-type: none"> ○ 8 618 master's degrees ○ 1 423 doctoral degrees <p>The CHE conducted a survey at the end of 2010 to obtain amongst other information the headcount enrolments at private providers. A total of 94 private providers responded to the survey.</p> <ul style="list-style-type: none"> • 96 487 headcount enrolments (not audited) (Note that not all the private providers provided headcounts. This number should purely be seen as indicative) <p>* These figures for the private higher education institutions were obtained from the "Register of Private Higher Education Institutions" produced by the Department of Higher Education and Training on 03 January 2012.</p> <p>** This information is collected from higher education institutions during and at the end of each academic year. Once it has been collected, it is verified and audited and discrepancies are resolved. For this reason, the audited figures for 2011 will only become available in the second half of 2012.</p>

Source: (Council of Higher Education; <http://www.che.ac.za/heinsa/overview/>).

The SA HE structure comprises both public and private HE establishments. These institutions are listed in Table 105.

Table 105: The South African Higher Education public and private higher institutions.

Public	Traditional universities	• Cape Town	
		• Fort Hare	
		• Free State	
		• KwaZulu-Natal	
		• Limpopo	
		• North-West	
		• Pretoria	
		• Rhodes	
		• Stellenbosch	
		• Western Cape	
		• Witwatersrand	
		• Johannesburg	
		• Nelson Mandela	
		• Unisa	
		• Venda	
Private	Comprehensive universities	• Walter Sisulu	
		• Zululand	
		Universities of technology	• Cape Peninsula
			• Central
			• Durban
	• Mangosuthu		
	• Tshwane		
	Design and Art Schools	• Vaal	
		• AFDA	
		• Inscape Design College	
	Theological Seminary	• The Open Window School of Visual Communication	
		• Auckland Park Theological Seminary	
		• Baptist Theological College of Southern Africa	
		• Doxa Deo School of Divinity	
		• George Whitefield College	
Universities and colleges	• South African Theological Seminary		
	• CTI Education Group		
	• IMM Graduate School of Marketing		
	• Midrand Graduate Institute		
	• Monash		
• St Augustine College of SA			
• Stenden University SA			

Source: (<http://hesa.org.za>).

6.12 SOUTH AFRICAN HE FRAMEWORK

While the significance of education is universally accepted in developing countries, these countries also face rigorous challenges, such as inferior and irrelevant education systems in the knowledge society (Yates 2007; Leach 2008). The White Paper A Programme for the Transformation of Higher Education (Department of Education 1997) created a structure for the South African tertiary education sector to attain the country's vision and goals, and ensure responsiveness to societal needs. This framework acknowledges the close and intricate connections generated by manifold competitive strategies and stimuli (Robertson 2008, p. 221) between the HE sector, economic policies, and regional interests. An indispensable part of any modern industrialised society's national innovativeness is the production of graduates, as they are able to produce new knowledge that underpins the modern knowledge economy.

The HE sector is in a fragile state, as the urgent need for uninterrupted higher learning and innovation is escalating, while the primary means to achieve these are threatened (Bradwell 2009). The Essential Science Indicators (ESI) database of the Institute for Scientific Information (ISI) named only seven of the 23 South African institutions that achieved the relevant threshold for being included.

Table 106: International rankings of South African Universities included in the ISI's report, according to ESIs — January 1999 – April 2009.

Discipline	Cape Town	Pretoria	Free State	Witwaters-rand	KwaZulu	Stellenbosch	Rhodes	Total no of institutions in ESI
Biology & biochemistry	448							687
Chemistry	771			684		774		907
Clinical medicine	456	1335		593	1124	726		2904
Engineering	955	637		802				1039
Environment / ecology	114	286		353	353	259		515
Geosciences	202			245				429
Plant & animal	166	122	771	509	389	307	443	835
Social sciences general	197	541		204	499	594		640
Agricultural sciences		326				278		413
Immunology	192							294
Microbiology						288		313
Psychiatry / Psychology						352		367

Source: (DHET 2012).

Journal article publication count and citation data constitute the data in this extensive collection of science performance statistics and science trends. Computer sciences and material sciences are not on the list, as no institution in SA reached the threshold. The comparison of the individual rankings of institutions with the full complement of institutions listed by the ESI suggests the danger of institutions being removed from the database in the near future. A comparison of publication units of South African universities for 2011 is given in Table 107.

Table 107: Comparison of publication units of South African universities for 2011, according to the ISI.

	ISI	IBSS	Total International	% International	SA Journals List	Total Journal Output
UP	804.26	100.25	904.51	77%	274.10	1178.61
UKZN	727.28	111.77	839.05	73%	312.97	1152.02
UCT	849.21	129.46	978.67	87%	145.37	1124.04
US	702.79	47.88	750.67	72%	297.39	1048.06
Wits	674.92	74.96	749.88	84%	147.95	897.83
UNISA	100.06	86.73	186.79	25%	545.84	732.63
NWU	329.50	84.45	413.95	63%	238.68	652.63
UJ	349.17	73.57	422.74	66%	215.25	637.99
UFS	280.00	42.28	322.28	63%	189.46	511.74
UWC	145.14	49.75	194.89	59%	135.17	330.06
RU	265.70	13.70	279.40	90%	29.87	309.27
NMMU	166.85	22.17	189.02	67%	94.50	283.52

Source: (DHET 2012).

(UP = University of Pretoria; UKZN = University of KwaZulu-Natal; UCT = University of Cape Town; US = University of Stellenbosch; Wits = University of Witwatersrand; UNISA = University of SA; NWU = North-West University; UJ = University of Johannesburg; UFS = University of the Free State; UWC = University of the Western Cape; RU = Rhodes University; NMMU = Nelson Mandela Metropolitan University).

Indicators of scientific performance and impact are meaningful measurements of didactic growth of a country's people. It is evident that SA does not produce adequate numbers of highly skilled scientists, or, indeed, researchers in most lines of work, hence the focus on fast-tracking skills development to augment the production of graduate students who might produce responsive and relevant knowledge (Council on Higher Education 2009, pp. 1-10). Through changing outcomes of processes, South African universities need to ensure that educational innovation, derived from a common understanding, is successfully adopted in the institutions as part of academic excellence, quality, and innovation. The average annual outflow of students from South African public HEIs for 2002 to 2004 is indicated in Figure 73, below.

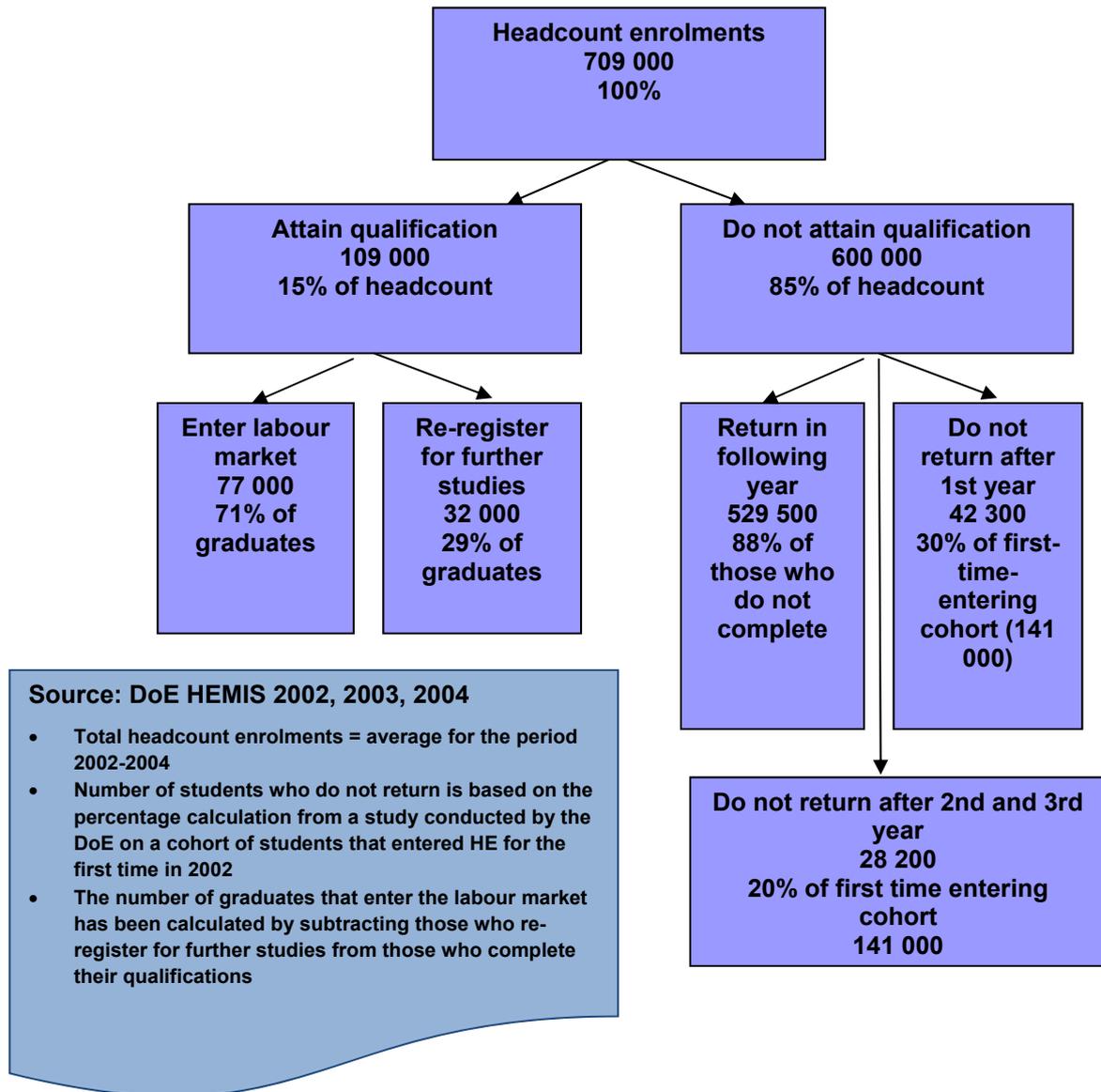


Figure 73: Average annual outflow of students from public HE institutions in SA: 2002–2004.

Source: (Adapted from Human Resources Development Review 2008, p. 280).

If a nation does not have sufficient numbers of adequately educated and trained workers, it needs to increase the number of knowledge workers who hold a PhD. There is a broad consensus in the science community in SA that not enough high-quality PhD graduates are being produced in relation to the developmental needs of the country (Anon. 2011, p. 15). In 2010, SA produced 0.05 PhD graduates per 1 000 of the population, an amount much less than that of foremost knowledge economies. To build a knowledge-based economy, SA needs to better the graduation rate of PhDs students by a factor of about five

over the next ten or more years, as these postgraduates may become first-class researchers or scientists.

In 2005, about 1 200 PhDs were awarded in SA; 1 274 in 2007 (or 26 graduates per million of SAs' total population), including 561 in the field of science, engineering, and technology (SET). To be a global contender, SAs' production of PhD graduates need to increase to around 3 000 SET PhD graduates. This implies that the average annual human capital pipeline output will have to be improved qualitatively (rate of knowledge production) and quantitatively (number of PhD graduates produced) (Ten-Year Plan for SA 2008–2018). In the past, using research-based methods of acquiring PhDs was the norm. Alternative methods need to be created to cater for practice-based doctorates, professional doctorates, and other, new routes, such as PhD by publication.

Table 108: The human capital pipeline required to reach 3 000 SET PhDs.

26 000	Higher grade maths and science matriculates
33 500	SET undergraduates
3 200	Honours
2 900	Masters
561	SET PhD graduates

Source: (Adapted from the Human Resources Development Review 2008).

In 2007, the Department of Science and Technology adopted a ten-year innovation plan for 2008 to 2018. This report, *Innovation Towards a Knowledge-based Economy*, builds on the foundations laid by the National Research and Development Strategy adopted in 2002. The ten-year plan drives SAs' conversion towards a learning economy. SA needs to become a world leader in biotechnology and pharmaceuticals, space science and technology, satellite industry and a range of innovations in energy security, global climate change science. SA should contribute to a greater global understanding of shifting social dynamics, as well as the role of science in stimulating growth and development.

The foremost objectives of this ten-year innovation plan is to increase the number of innovative outcomes (e.g., intellectual property-like patents). In developed countries, innovation skills are honed at specialist universities, such as the Massachusetts Institute of

Technology (MIT) in the USA. In the South African environment, the focus should be on integrating innovation studies with all levels of tertiary study in science and engineering, in order to produce a workforce with the innovation skills that we need and which will contribute to our competitiveness.

The HE system is further complicated by other, frequently changing contextual factors and expectations, such as those related to professional and accreditation bodies, who demand skills and attributes that pose continuously changing challenges. Furthermore, all these interplaying forces come from different sources, creating polarities that need to be managed to ensure quality teaching. These tremendous challenges mean that it is necessary for academics to adopt innovative practices and processes (Devlin & Samarawickrema 2010, pp. 119-120). These challenges are technical, as well as associated with pedagogical thinking and organisational structures (Laurillard 2002). HE institutions will have to develop their traditional structures and their pedagogical practices to enhance the co-operation between the world of work and academia (Tynjala, Valimaa & Sarja 2003, pp. 150-153).

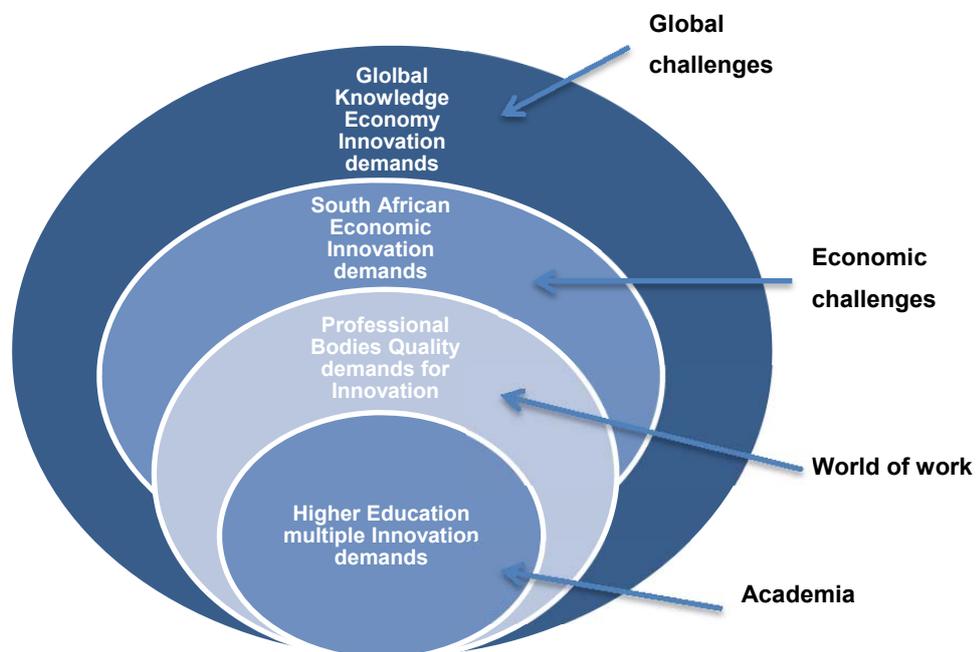


Figure 74: Interplaying demands for innovation adoption.

Source: (Own compilation).

To address the quality of education, as well as develop graduates with appropriate and applicable attributes, the South African Qualifications Authority (SAQA) Act (Act No. 58 of 1995) was promulgated in October 1995, with the task of establishing the SANQF. The shift in thinking by SAQA has been from education for employment (advancing the ability to do a specific job) to education for employability (developing the ability to adapt acquired skills to new working environments). The new education and training system must be able to support the creation of an adaptable workforce:

The functions of SAQA are essentially twofold:

- To oversee the development of the NQF by formulating and publishing policies and criteria for registration of bodies responsible for establishing education and training standards or qualifications and for accreditation of bodies responsible for monitoring and auditing achievements in terms of such standards and qualifications.
- To oversee the implementation of the NQF by ensuring the registration, accreditation and assignment of functions to bodies referred to above, as well as the registration of national standards and qualifications on the framework. It must also take steps to ensure that provisions for accreditations are complied with and that where appropriate, registered standards and qualifications are internationally comparable. (SAQA Act, SAQA website) (Office of the President, no. 1521: South African Qualifications Authority act, No. 58 of 1995.)

SAQA promotes high-quality education and training in SA by embracing the concept of lifelong learning for all. In order to realise this objective, SAQA has established and maintains:

- a system for setting nationally recognized and internationally comparable education and training standards and qualifications from NQF Level 1 (Grade 9 or Adult Basic Education and Training Level 4 – the exit point from General Education and Training) to NQF Level 10 (post-graduate qualifications)
- a national quality assurance system to ensure that education and training are delivered to the set standards
- an electronic management information system which records all relevant information on the achievements of South African learners. (National Learners' Records database (www.saqa.org.za/nlrinfo.php#sthash.N93Y05Uj.dpuf, 2014)

SAQA further has the responsibility of evaluating foreign educational qualifications to establish their South African equivalent. SAQAs' contribution should ensure that South Africans have access to quality education and skills development. Ten categories of applied competencies are used as level descriptors, to ensure coherence across learning that leads to different qualifications and to assess international comparability. The theoretical basis of the SANQF and the ten level descriptors is applied competence, which has three component elements, namely foundational competence, synthesis and

evaluation competence, and reflective competence, that incorporates learner autonomy (South African Qualifications Authority 2012, p. 1).

For SA to be a global player, the country needs highly skilled, but also socially dedicated professionals. These professionals need to build up the country's enterprises, services, and infrastructure, while also contributing to the production, attainment, and application of original knowledge, to secure the future affluence of the country. Moving human resource talent management to a higher plane requires a focus on the education–economy relationship of SA, which is encapsulated in three skills bands in the SANQF:

- entry-level skill band — pre-matriculation (the largest percentile of the employed population worldwide);
- intermediate skill band — post-matriculation, pre-degree certificates/diplomas; and
- high skill band — HE degrees and postgraduate qualifications.

(Anon. 2003).

The SANQF is a set of values and guidelines by which learner achievement is evaluated. It ensures an integrated system that promotes lifelong learning, and ensures national recognition of acquired skills and knowledge.

These categories are given in Table 109. Contextual interpretation of the level descriptors within each of the three sub-frameworks across academic (higher education qualifications), professional (further education and training), and occupational contexts is encouraged by SAQA (Level Descriptors for the South African National Qualifications Framework, 2010).

Table 109: NQF level descriptors.

NQF LEVEL	LEVEL DESCRIPTORS (SCOPE OF KNOWLEDGE)	LEVEL DESCRIPTION	BAND	QUALIFICATION TYPE
HIGHER EDUCATION AND TRAINING CERTIFICATE (HETC)				
10	Critical knowledge	Reflection		<ul style="list-style-type: none"> Post-doctoral research degrees Doctorates
9	Specialist knowledge			<ul style="list-style-type: none"> Masters degrees
8	Applied knowledge			<ul style="list-style-type: none"> Professional qualifications Honours degrees
7	Integrated knowledge	Organisational		<ul style="list-style-type: none"> Diplomas National 1st degrees
6	Detailed knowledge			<ul style="list-style-type: none"> Higher Certificates
5	Informed understanding			<ul style="list-style-type: none"> Occupational Awards National certificates
FURTHER EDUCATION AND TRAINING CERTIFICATE (FETC)				
4	Fundamental knowledge	Organisational	Grade 12	<ul style="list-style-type: none"> National skills certificate & Occupational awards
3	Basic knowledge		Grade 11	
2	Operational knowledge	Own and specific environment	Grade 10	
GENERAL EDUCATION AND TRAINING CERTIFICATE (GETC)				
1	General knowledge	Own and specific environment	Grade 9 Abet level 4 GET certificate	

Source: (The SA Qualifications Authority Level Descriptors for the SA National Qualifications Framework, 2012 and the National Qualifications Framework ACT 67 of 2008).

In SA, the qualifications conferred by universities need to be aligned with the Higher Education Qualifications Sub Framework (HEQsF). Quality is by nature a dynamic process and a flexible notion appropriate to particular circumstances (Mc Donald 2010, p. 6), and the permanent subcommittee of the Council on Higher Education (CHE) has assumed executive accountability for guaranteeing quality in HE. This responsibility is assigned to the CHE by the HE Act (Act No. 101 of 1997). The explicit responsibility of the Higher Education Quality Committee (HEQC) in higher education is stipulated as to:

- encourage quality assurance;
- appraise the institutional quality assurance procedures; and
- sanction the academic programmes on offer.

The establishment, registration, and modus operandi of the HEQC is determined by the CHE, all within the framework and procedural guidelines developed by SAQA (CHE HEQC Framework for Delegated Functions 2008).

The general process through which the HEQC performs its function of quality assurance at universities is institutional audits. HE institutions establish mechanisms and procedures to self-assess their effectiveness on a continuous basis, with the emphasis on accountability on all levels, rather than improvement. In such a self-evaluation process, the main idea is to determine the institution's mission statement and its goals/aims and objectives in the light of the quality of education it wishes to provide and the position in which it functions. Universities are perceived as autonomous, and, therefore, these audits focus on the capacity of these institutions to oversee the quality of their core purposes — teaching and learning, research, community engagement, and support services. The audit panel inspects policies, systems, procedures, strategies, and resources to determine the institutions' capacity to fulfil these purposes. Furthermore, the alignment of educational output with internal and external stakeholder expectations and economic need is assessed. This process guarantees the well-being of universities and the effectiveness of a HE institutions' practices (HEQC Audit Manual). In HE, a process of analytical self-evaluation of the institutions own performance forms a foundation of quality affirmation. These evaluations are done through institutional audits, to ensure quality in the three core functions of teaching and learning, research, and community engagement (UK Quality Assurance Agency 2010).

In 2002, major structural transformations in the South African HE environment led to the reconfiguration of 36 universities and technikons to 23, divided in terms of a new typology that distinguished between universities of technology, comprehensive institutions, institutes of higher education, and universities (Higher Education Amendment Act, Act No. 63 of 2002). It is likely that those universities that have led the research field in the past will continue to do so, while the comprehensive institutions will struggle to improve their research capacity under the weight of their institutional commitment to diversity of

programmes, differential entry and exit requirements, horizontal and vertical articulation, responsiveness to local, national, and regional needs, and the fortification of community, civic, government, business, and industry partner relationships for progression, both locally and provincially (Department of Education 2004, p. 5). To address the challenges in the education and training sector, SA is in pursuit of an integrated system of education and training, as reflected in Table 110.

Table 110: Schooling and post-school landscape of SA.

	School Education	Post School Education and Training					
	Department of Basic Education (DBE)	Department of Higher Education and Training (DHET). The Human Resource Strategy for South Africa (HRD-SA), a government initiative includes partners from labour, business, universities and training institutions led by a council, chaired by the Deputy-President and managed by DHET. It provides overarching framework for all the work done by DHET. Focus: diverse and relevant post-school education and training opportunities, in a range of different institutions, within one coherent system. Challenges: Amidst massive employment and economic recession, SA faces shortage of skilled labour.					
	Primary and secondary schooling	FET college sector	SETAs (National Skills Authority and National Skills Fund)	Universities (23) SA has an inverse college/university ratio: Globally 70% colleges and 30% universities SA 30% colleges and 70% universities 1. Inclusivity driven by increased enrolment in non-research intensive lower-quality institutions 2. Gap between enrolments and yearly graduations (size varies between institution type)	Other Institutions such as nursing and agricultural colleges		
	No articulation with one another in past – new organisational configuration will change this.						
				Red: high-quality, research-intensive	Green: middle quality research and teaching focused	Blue: lower quality and teaching-intensive	
Quality assurance	UMALUSI	UMALUSI	Training Quality Assurance desks of SETAs	Council for Higher Education			
	NQF review and Skills Development Amendment Act (2008) suggested sector and not band QA. UMALUSI for schooling sector, HE for Higher Education and FET band and the Quality Council for Trades and Occupations (to be established).						
NQF levels	I	II, III, IV		V, VI, VII, VIII, IX, X			
Role	To provide the skills and competencies that will allow individuals to perform productive roles within economy and society. Not only about knowledge and skills, also include values, attitudes and creative and emotional	Occupational/vocational qualification Gain practical, workplace experience.	Skills development through partnerships with employers driven by Sector Skills Plans.	All learning programmes leading to a qualification that meets the requirements of the Higher Education Qualifications Framework (HEQF).			

	developments – contribute to responsible, active and productive citizenship. (Bloch 2009, 11)						
Outputs	worrying in terms of international standards			Low quality			
Dropout	50% between grades 10-12			High			
Systemic inequality	Access determined by race / wealth						
Gap between enrolments and yearly graduation				50% graduation	50% graduation	35% graduation	

Source: (Dutschke 2010, pp. 46-48).

The priority given to the integrated system of education and training is ruminated on in the development of the performance monitoring and evaluation targets for the Minister for Higher Education and Training, which raises the following concerns:

- insufficient production of suitably skilled and qualified persons through universities in disciplines fundamental to development, both social and economic;
- insufficient graduation rates;
- limited capacity of the HE sector to absorb more students;
- too few persons engaged in research, knowledge production, and innovation; and
- novel research capacity and productivity has an unsatisfactory pipeline.

(Dutschke 2010).

In SA, the answers to the fundamental question concerning the role of the university have been shaped by responses of political intent, which promote so-called national interests, as well as the interests of the market place, as publicised in the agenda for the transformation of HE in SA (Luescher & Didacta, 2003). The agenda includes the transformation of university education that is fundamentally concerned with the advancement of national interests and the establishment of a democracy in SA. Issues that are paramount in spelling out what these national interests might be were identified by Badat (2002, p. 17):

- the enablement of HEIs to influence equity and redress;
- fostering a substantive democracy;

- the necessity for economic development, including the creation of jobs and poverty reduction; and
- social services and measures to combat the threat of HIV/Aids.

These issues highlight what non-university organisations (e.g. state, marketplace) understand the responsibility of universities in SA to be (Higgs 2004, p. 29).

HE embraces social, cultural, and economic activity as a result of their teaching, research, and wider service functions (Clarke 2008, p. 262), but is also transformed as a result of economic, social, and structural drivers (Clarke 2008, p. 268). When knowledge development surpasses national stocks and an expanded demand from several other stakeholders, it generates an excess for institutions, who experience great difficulty mustering the needed capacity and capabilities to respond to this demand response imbalance (Clarke 1998, p. xiii).

6.13 UNIVERSITY OF PRETORIA

In the ongoing discussions regarding the reform of HE in SA, it is evident that the dominant issue governing proposals to transform universities is social transformation. According to Higgs (2002):

the role of a university is determined by the requirements implicit in the provision of high-level manpower, and the objectives. Its teaching and research programmes are directed at vocational needs, the establishment of a just South African society and the creation of wealth. (Higgs 2002, p. 11)

The recent debate regarding whether such political, social, and economic roles should be assigned to universities in SA has been taken up by Higgs (2002) and Mthembu (2002) and testifies to the seriousness of the questions of meaning and purpose that universities face.

The present researcher has chosen the UP as the context for research. A case study of UP, a research-intensive HEI, institution (UP Strategic plan 2007-2011:3), is the empirical source of data from which claims are made in this research. The stature of UP in terms of head count enrolment growth (annual averages) in relation to other universities in SA is reflected in Table 111:

Table 111: SA universities' head count enrolment growth (annual averages).

Institutions	2005-2010	2010-2012
CPUT	2.10%	2.06%
CUT	4.00%	0.56%
DUT	2.00%	-0.62%
MUT	0.30%	3.76%
NMMU	1.60%	0.91%
NWU	7.60%	2.67%
Rhodes	2.50%	1.56%
Stellenbosch	4.70%	0.30%
TUT	-2.20%	-0.07%
UCT	2.60%	2.06%
Fort Hare	4.10%	5.89%
UFS	3.90%	4.05%
UJ	1.20%	0.47%
UKZN	0.30%	0.77%
UL	0.70%	10.55%
UP	4.30%	0.34%
Unisa	7.10%	7.05%
UV	0.30%	-1.68%
UWC	4.40%	4.16%
Wits	4.50%	1.58%
UZ	7.20%	5.64%
VUT	4.20%	-0.50%
WSU	1.80%	-4.05%

Source: (SA Higher Education Data, 2012).

(UP = University of Pretoria; UKZN = University of KwaZulu-Natal; UCT = University of Cape Town; US = University of Stellenbosch; Wits = University of Witwatersrand; UNISA = University of SA; NWU = North-West University; UJ = University of Johannesburg; UFS = University of the Free State; UWC = University of the Western Cape; RU = Rhodes University; NMMU = Nelson Mandela Metropolitan University).

UP is the largest contact residential university in the metropolitan area of Tshwane, and consists of nine faculties, and a business school, comprising 134 departments and 19 support service departments. Statistics regarding the size of the university in terms of the number of departments, students, and academic staff is given in Table 112.

Table 112: Student enrolment headcount at UP per faculty for 2010 to 2014.

Faculties	Dept	2010		2011		2012		2013			2014			TOTAL
		Staff	UG/PG	Staff	UG/PG	Staff	UG/PG	Staff	UG	PG	Staff	UG	PG	
Humanities	21	206	6007	209	6060	210	5937	206	4615	1663	196	4769	1664	31742
Natural and agricultural Sc	19	287	6009	293	6159	292	6309	300	5191	2014	294	5228	2042	34418
Law	6	57	2020	61	1915	65	1824	61	1327	581	65	1459	611	10046
Theology	6	23	802	23	735	25	742	25	230	522	27	227	534	3915
Economic and Management Sc	10	191	9382	191	9294	209	9067	183	7112	2173	190	6820	2120	46932
Veterinary Sc	5	102	929	113	1046	109	1233	111	541	706	111	752	605	6358
Education	5	83	4246	83	4442	87	4363	87	3516	989	81	3469	1013	22459
Health Sciences	49	456	5375	478	5727	512	6116	550	5078	1532	576	5067	1532	32999
EBIT	13	224	9808	239	10119	244	10684	244	7374	4050	244	7751	4227	55208
TOTAL	134	1629	44578	1690	45497	1753	46275	1767	34984	14230	1784	35542	14348	244077

Source: (Birap 2015).

The university functions from six campuses and various other sites of operation. These are:

- Hatfield Campus, Pretoria, which accommodates six faculties (including the experimental farm, the LC de Villiers sport facilities and residences);
 - Groenkloof Campus, accommodating the Faculty of Education;
 - Mamelodi Campus, which was incorporated into UP in 2004 in terms of Section 24 of the Higher Education Act (Act No. 101 of 1997) as part of the restructuring of the South African HE system;
 - Prinshof Campus, accommodating the Faculty of Health Sciences (this faculty also operates in a number of hospitals in three provinces);
 - Onderstepoort Campus, accommodating the Faculty of Veterinary Science;
 - Sandton Campus in Illovo, accommodating the Gordon Institute of Business Science; and
 - a number of other sites, including the Hammanskraal Campus and experimental farms
- (Own compilation from UP website 2013). UP is further described in Table 112.

Table 113: Description on the University of Pretoria.

<p>Vision: to be a leading research-intensive university in Africa recognised internationally for its quality, relevance and impact, and also for developing people, creating knowledge and making a difference locally and globally.</p> <p>Strategic goals:</p> <ul style="list-style-type: none"> • To be a leading research-intensive university • To strengthen the university's international profile • To strengthen the university's impact on economic and social development • To pursue excellence in teaching and learning • To increase access, throughput and diversity <p>The University of Pretoria consists of the following structure:</p> <ul style="list-style-type: none"> • Faculties of: <ul style="list-style-type: none"> ○ Economic and Management Sciences ○ Education ○ Engineering, the Built Environment and Information Technology ○ Health Sciences ○ Humanities ○ Law ○ Natural and Agricultural Sciences ○ Theology ○ Veterinary Sciences • Gordon Institute for Business Science • 60 research institutes, centres and units • Division of Institutional Advancement (DIA) <p>The student profile of the University of Pretoria consists of:</p> <p>Total number of contact students: 45 642</p> <ul style="list-style-type: none"> ○ Undergraduate: 31 873 (70%) ○ Postgraduate: 13 769 (30%) <ul style="list-style-type: none"> • Male: 20 554 (45%) • Female: 25 088 (55%) • National including students with permanent residence: 41 423 <p>(Africans from South Africa – 15 624)</p> <ul style="list-style-type: none"> • International: 4 219 (9.2%) <p>(Africans from other African Countries – 2 954)</p> <p>Total number of annual intake per undergraduate and graduate classes</p> <ul style="list-style-type: none"> • Undergraduate (2012 registered headcount plus cancellations): 32 738 • Postgraduate (2012 registered headcount plus cancellations): 14 099 <p>The University of Pretoria's academic planning framework:</p> <p>Linking teaching, learning and research – emphasis is on research, inquiry-led curriculum and an integrated approach to community engagement (placements with communities arranged by Community Engagement Office.)</p> <p>There are three metrics of excellence in teaching and learning:</p> <ul style="list-style-type: none"> • Pass rate • Percentage of top students • Number of Graduates employed

Source: (Adapted and changed from the UP website 2015).

(www.up.ac.za).

The average graduation index for the University of Pretoria for 2009 to 2011 is reflected in Figure 75.

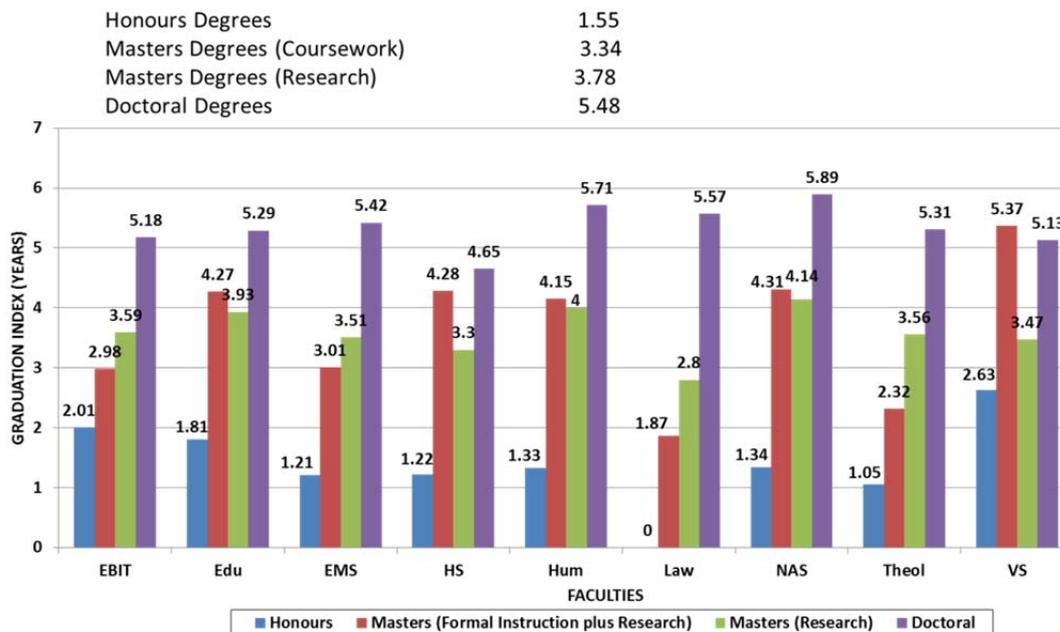


Figure 75: Average graduation index — 2009—2011.

Source: (De la Rey 2013).

The university aims to positively contribute, both locally and internationally, to the knowledge production in the country. The mission of UP in the institutions' Strategic Plan of 2007 to 2011 was expressed in its three principal purposes of research, teaching and learning and service learning. It relates to being locally relevant and internationally competitive and was linked to the institution's strategic plan by the theme the 'innovation generation' (University of Pretoria Strategic Plan, 2007 to 2011). The primary goal of this theme was forward-looking – creating the future: 2007 to 2011 – and communicated the organisations' intention to contribute to knowledge production and skills development. UP further advances the scholarship of teaching through the inclusion of modern innovation and remains at the fore-front of innovations in teaching as reflected in its guidelines for teaching and learning (Senate document, S6144/06, 2006). The strategic priorities of the university, are described in Table 114.

Table 114: UP strategic priorities.

GOAL 1. To be a leading research university in Africa						
Performance indicators and targets, 2013 — 2016		2009	2010	2011	Target 2013	Target 2016
	% of NRF-rated researchers amongst C1 staff*	15.8	17.3	18.1	20.9	30.0
	Publication units per C1 FTE staff	0.7	0.6	0.6	0.7	1.0
	% of ISI publications to total accredited journals	65.8	67.1	68.5	70.3	73.0
	Weighted M and D graduate output per C1 FTE staff	0.7	0.7	0.7	0.8	1.0
	% C1 staff with D-level degrees (excl. joint appointments)	41.7	45.4	48.4	50.2	53.0
GOAL 2. To strengthen the university's international profile						
Performance indicators and targets		2009	2010	2011	Target 2013	Target 2016
	% of PG international contact students	13.4	13.3	13.9	14.7	16
	Number of international postdoctoral fellows	52	43	38	47	60
	% international staff	6.7	3.5	3.9	5.1	7
	% ISI publications co-authored with non-SA academics	41.9	42.8	47.8	52.2	59
GOAL 3. To strengthen the University's impact on SA economic and social development						
Performance indicators and targets		2009	2010	2011	Target 2013	Target 2016
1	Number of graduates in scarce skills areas (incl. distance)	7136	7785	7169	7501*	8000*
2	% registrations in SET (contact students)	48.3	48.5	49.8	49.9	50
3	% registrations in Business (contact students)	23.0	22.4	21.7	22.2	23
4	% of postgraduate contact students to total contact students	28.5	28.6	28.3	28.7	30.0
GOAL 4. To pursue excellence in teaching and learning						
Performance indicators and targets		2009	2010	2011	Target 2013	Target 2016
1	% of contact graduates to total enrolled contact students	22.4	22.2	22.5	23.5	25
2	% successful FTE students to total FTE enrolments	80.0	80.0	80.9	81.3	82
3	% top achievers in grade 12 choosing UP	25.9	32.0	27.2	30.3	35
4	FTE contact students per FTE teaching staff member	19.4	19.4	19.2	19.2	19.2
GOAL 5. To increase access, throughput and diversity						
Performance indicators and targets		2009	2010	2011	Target 2013	Target 2016
1	M graduates as % of M enrolments	19.6	20.3	20.5	23.9	29.3
2	D graduates as % of D enrolments	13.5	12.6	12.2	15.0	18.9
3	% of UG black contact students	40.5	41.8	43.3	45.3	50.0
4	% of PG black contact students	50.5	51.5	52.3	54.3	56.6

Source: (UP Strategic Plan 2013).

As the previous plan (2007–2011) drew to a close, UP developed a new strategic plan (UP Strategic Plan – 2025), to encapsulate the keystones of a shared vision, role and identity in a complex interconnected global world. This framework includes cycles of five years so as to fully exploit the vigorous nature of change that needs to sustain the responsiveness of UP on its course, set in Africa. The diversity in terms of staff, students, programmes offered, and areas of research differentiates the institutions. UP aims to contribute to the development of human capital while also generating the knowledge and skills needed for attending to the numerous challenges of our developing economy, society and region.

According to Politus (2008, p. 182), decisive determinants in reaching a sustainable organisational competitive advantage in the new economy are creativity and innovation, which lead to change. Therefore, organisations have to create work environments that support the continuing, detailed, and complex cycle of innovation, starting with creativity, moving to the risky process of choosing the right idea that leads to innovation and, ultimately, enhanced organisational change. The context within the organisation that gives rise to innovation is influenced by three factors: the historical and cultural traditions of the organisation, the infrastructure of the organisation, and the policies and leadership employed in governing the organisation, as the performance of any system depends, not only on how it is built, but also on how it is run.

In our quest to define and understand innovation generation at UP, essential contributors to change and innovation — faculty members have to be considered. The fact that decision-making processes are diffused and decentralised allows for disciplines and departments to have their own goals, independent of the institution's strategy. HE institutions have, within each scientific area, capacity for innovation and adaptation, but, at an organisational level, HE institutions are very resilient to change (Cardoso 2005).

The extent to which innovation is integrated into the organisation and how it changes the execution and outcome of processes determines the success of innovation adoption (Gopalakrishnan & Damanpour 1997, p. 17). The challenge that faces UP as an internationally renowned South African university is to agree on a common understanding of the term the *innovation generation*. UP needs to ensure that pedagogical innovation, as

derived from a common understanding, is successfully adopted in the organisation as part of its academic excellence, quality, and innovation strategy.

An institutional quality review was done in 2008 at UP (the second was planned for the period 2013–2015), and the results of this audit feeds into the on-going quality management activities of the university. The process of self-evaluation and preparation for an audit in itself provides an opportunity for ensuring alignment with the strategic plan of the university and its implementation. In the audit report (CHE University of Pretoria Audit Report 2008, pp. 2-3) of the CHE, released in November 2008, it was stated that UP needs to debate the terms innovation and innovation generation, as they are associated with and influence the teaching and learning process, in addition to the institution's culture. Such a debate should culminate in a common understanding of these terms as they are realised in the institution's three core functions.

Diaz et al (2009) identified 'encouraging faculty (academic members of staff) adoption and innovation in teaching and learning with IT as a challenge' (Diaz *et al.*,2009:47-55). This challenge is exacerbated by the fact that significant numbers of academic staff will be retiring in the next decade. Future academic staff members will share some characteristics with their students, such as being technology adopters and innovators. Engaging with them in these professional development and support ventures will require a varied menu of options, to leverage their talents extensively. According to Diaz *et al.* (2009, p. 54), some recommendations to consider are:

- avoid making assumptions about what the needs of academic staff are; preferably uncover needs through relationship management;
- familiarise yourself with and establish a diverse menu of instructional technology tools, including discipline-specific tools; and
- develop collaborative support programmes that explore possible ways to engage and enlist the aid of new staff in collaborating with and helping to lead academic staff development.

The most important principle to apply is to allow faculty members an opportunity to provide inputs in designing opportunities that model best practice focusing on the success of the student life-cycle, incorporating issues such as retention, access, course completion and

progression. Considerations need to converge with the changing HE landscape and include flexible scheduling and various delivery options for the faculty members from which they can select.

As higher education institutions are a vehicle for supplying highly skilled graduates with capacity for innovation, the study will concentrate on analysing the factors in the processes of teaching and learning that initiate and sustain innovation adoption by academics. The adoption of educational innovation in the teaching and learning process in a HE institution would produce graduates who meet the expectations of all stakeholders and have the appropriate and relevant graduate profile. Viewing universities as the 'breeding ground for skilled individuals' (CFA; 2005) means these universities need to align themselves with innovation and new ideas, both at under-graduate and post-graduate programme level, by creating a creativity-driven culture.

Substantive changes are needed in HE institutions' teaching and learning functions, in order to produce globally educated students in tune with the economic shifts in the direction of a more service-based economy and growth that is spearheaded by innovation. Adoption of innovation within the teaching and learning functions would deliver graduates who would advance innovative capacity and business sophistication in the country, which would ultimately lead to increased market efficiency, as highlighted by the GCR of 2009.

The White Paper on Education (Department of Education 1997) states that the best indicator of teaching excellence is how well the intellectual capacity of students is developed by imparting the fundamental principles of scientific thoughts and praxis in the various disciplines. To support this indicator of excellence, it is of fundamental importance to include innovation in curriculum/programme design and in methodologies of national/international repute in the teaching of specific subject areas. Figure 8 (Pg 91) depicts a conceptual framework displaying the interrelationships between process activities and their outcomes. The figure shows causal linkages of the concepts in the process of teaching and learning leading up to desired outcomes of innovation adoption by academics.

6.13.1 UP Context

UP is a research-intensive university, and is an organism that adapts in response to change. Culturally, it is a complicated system, due to diverse values, which leads to very complex innovation processes.

The future of the institution is driven by its social, environmental, and financial viability. This future needs to be grounded in sustained quality, relevance, financial capacity, and the diversity potential of the institution. The institutions' research-intensive vision implies that the approach to follow will situate research, teaching, learning, and community engagement securely in national and regional contexts. Pivotal to this strategy is that it impacts on its proximate environments and the community at large, and that UP continues to be a centre of knowledge creation, addressing the global academic community.

Table 115: UP vision, mission, and values.

Vision	<i>'To be a leading research-intensive university in Africa, recognised internationally for its quality, relevance and impact, and also for developing people, creating knowledge and making a difference locally and globally.'</i>
Mission	<i>'In pursuing recognition and excellence in its core functions of research, teaching and learning, and integrating engagement with society and communities into these, the University of Pretoria will use quality, relevance, diversity and sustainability as its navigational markers.'</i>
Values	<ul style="list-style-type: none"> • <i>'in a resource-constrained world where vast disparities remain, the University must</i> • <i>endeavour to produce graduates who appreciate the importance of community</i> • <i>service, entrepreneurial endeavours and innovative actions in generating</i> • <i>employment and development in our local communities.'</i>

Source: (UP Strategic Plan 2025, p. 5).

Underpinning the operationalisation of the UP strategy, the institution has support services that strive to strengthen teaching and learning, as well as research. These departments are: the Department for Education Innovation (DEI) and the Department of Research and Innovation Support (DRIS), respectively. The functioning of these departments is explained in Table 116.

Table 116: Support departments.

Research and innovation Support (DRIS)	<ol style="list-style-type: none"> 1. Providing effective information, support and oversight of postgraduate postdoctoral programmes 2. Providing information support and management of research grants and contracts 3. Undertaking international fundraising 4. Maintaining appropriate data 	<ul style="list-style-type: none"> - Significant increase in research funding stream - External recognition of management efficiency and with regard to grants and contracts - Well-established information hub and oversight functionality of postgraduate faculty processes - Alignment of database to internal and external research data sources
Education Innovation (EI)	To pursue excellence in teaching and learning:	
	<ol style="list-style-type: none"> 1. Align teaching and research through inquiry-led curricula 2. Strengthen base disciplines 3. Reduce the number of modules 4. Maintain high-level professional programmes 	<ul style="list-style-type: none"> - Performance of base disciplines against core indicators - Peer review of WHAT is taught and HOW - Peer evaluation of how teaching makes provision for a diverse student body - Interrogating reasons for retaining modules - Professional accreditation of programmes
	Teaching and learning support:	
	<ol style="list-style-type: none"> 1. Providing targeted development and support for staff and students 	<ul style="list-style-type: none"> - Number of academics trained - Number of lecturers supported to improve throughput rates and curricula mapping - Number of students supported

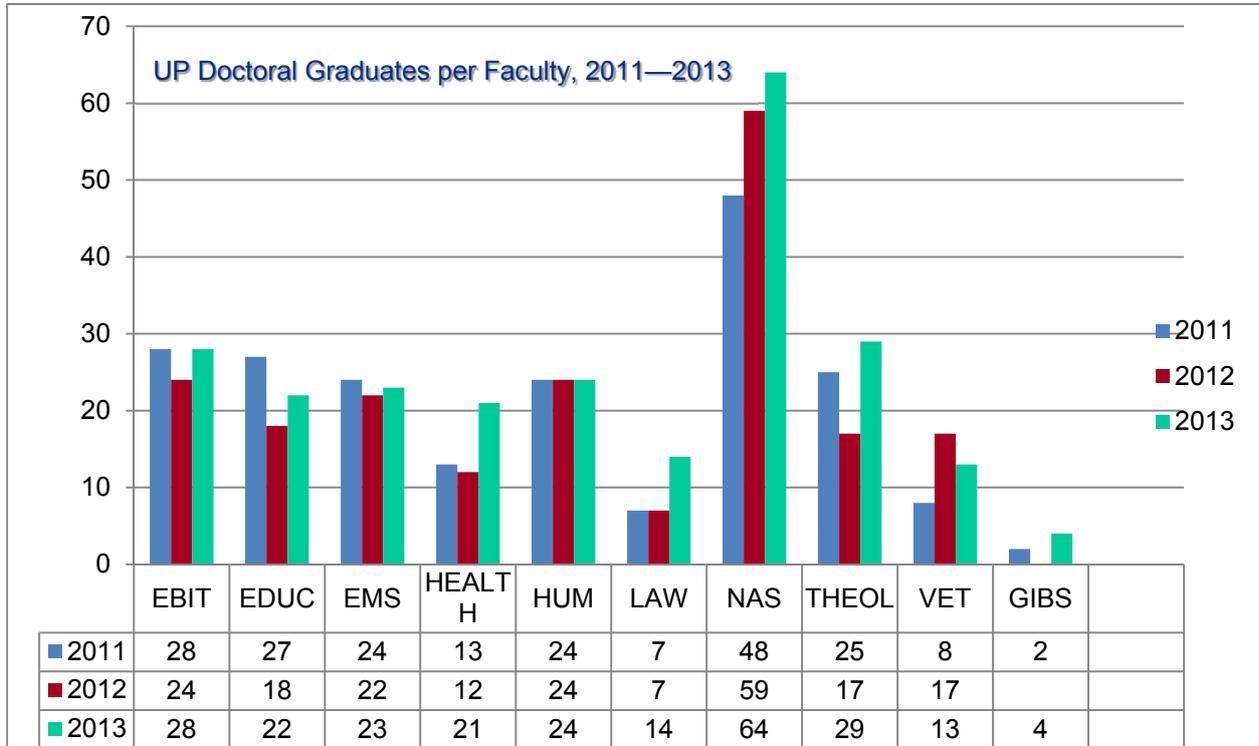
Source: (UP Strategic Plan 2025, p. 18).

6.13.2 Department for Research, Innovation and Support

DRIS supports the institutional research strategy for 2025, which strives to: increase research productivity through performance targets for all disciplines (the indicator is publications in accredited, high-impact journals (Statistics SA 2012–2013));

Faculty	2012 Units	2013 Provisional Units
Theology	113	157.74
Health Sciences	182.01	173.74
Education	46.96	37.36
Law	101.46	126.25
EBIT	184.39	184.79
Veterinary Sciences	89.72	112.1
Natural and Agricultural Sciences	306.18	354.18
Humanities	140.04	160.61
Economic and Management Sciences	93.61	96.89
Gordon Institute for Business Sciences (GIBS)	13.22	10.49
InterFaculty	6.6	4.02
Totals	1277.19	1418.17

- increase the capacity for postgraduate training (the indicators are PhD graduates and postdoctoral fellows, postgraduate progress, and postgraduate throughput rates) (Burton 2015, slide 19-20);

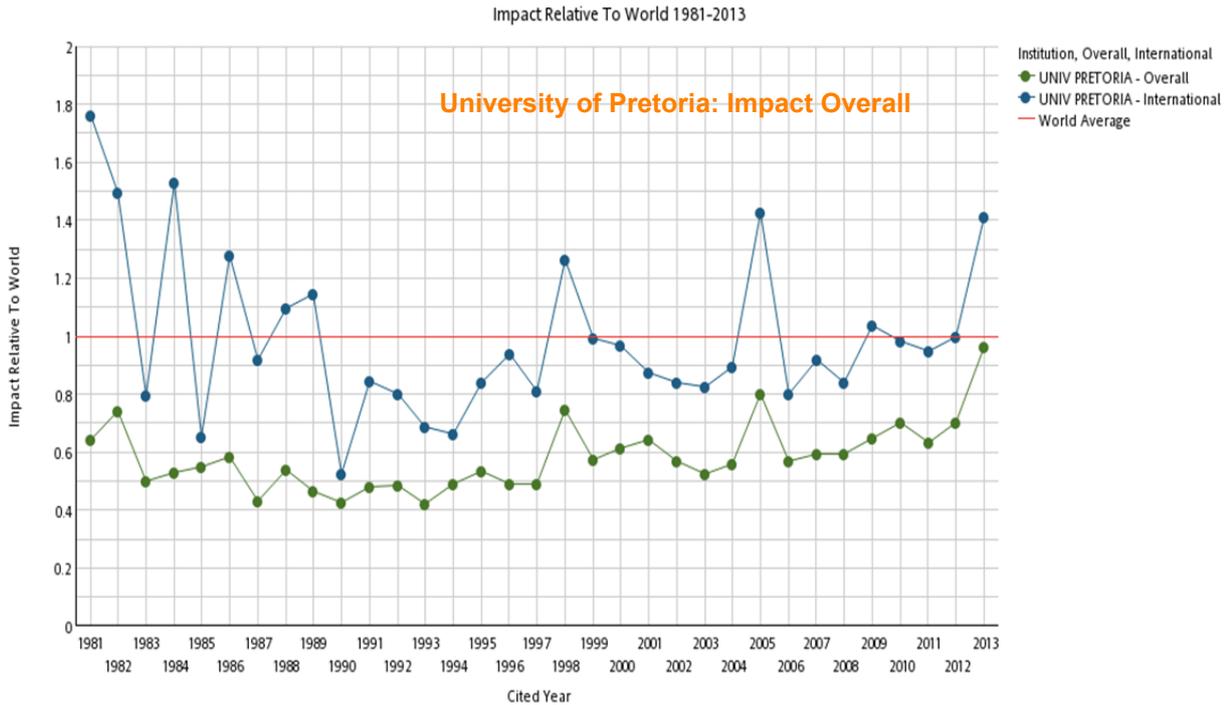


	<u>2013</u>	<u>2012</u>
Honours Degrees	1.52	1.55
Masters Degrees (Formal instr and research)	3.11	3.16
Masters Degrees (Research)	3.68	3.70

- nurture research with national relevance and international impact; the indicators are international recognition, and international collaborations and partnerships (Burton 2015, slide 14);

		2011	2012	2013	2014	Target 2016
6	% of PG international contact students	13.9	14.9	15.8	15.8	16.0
7	Number of international postdoctoral fellows	46	83	128	145	60
8	% International academic staff	3.5	3.9	4.0	4.8	
9	% WoS publications co-authored with non-South African/international researchers	46.9	50.5	51.9	*	

- Grow existing areas of research expertise (the indicators are quality and impact of research)(InCites™, Thomson Reuters (2013)); and



- expand the university's contribution to human capital development and innovation (the indicators are NRF ratings).

Number of NRF Rated Researchers 2010-2014					
Categories	2010	2011	2012	2013	2014
A-rated	10	8	9	11	13
A1	4	3	3	3	4
A2	6	5	6	8	9
B-rated	58	69	70	71	80
B1	12	18	19	17	17
B2	18	18	14	16	22
B3	28	33	37	38	41
C-rated	168	183	209	229	230
C1	36	36	36	38	36
C2	86	100	114	124	122
C3	46	47	59	69	72
P-rated	5	4	2	2	1
Y-rated	36	40	41	54	61
Y1	4	8	8	9	13
Y2	32	32	33	46	48
L-rated	5	2	2	2	1
TOTAL	284	309	333	372	386

A challenge for the university is that faculties are normatively closed, and display a silo mentality.

6.13.3 Department for Education Innovation (DEI)

The vision of the Department for Education Innovation (EI) is: 'Creating synergy towards innovative education environments for student engagement and success'. (EI annual Report 2015, p 4). Quality teaching at undergraduate level is the basis for post-graduate studies, and links to the strategic goal of UP to promote the institutions international profile through research. The Department engages with academics to innovate their teaching practice and to implement a hybrid teaching model, enhancing student success. Effective teaching and learning is central to fulfilling the primary function of the university.

6.13.4 UP Students

The main goal of a university is to educate students, and attracting the most gifted students is a priority for UP. Given the importance of diversity, future student cohorts need to be representative of SAs' demographics in terms of race, gender, social class, and language preference, and have the intellectual interest and ability to succeed.

Currently, achieving a representative student body requires the university to admit students within a fairly broad range of final school results. Specific provision is made for degree programmes with foundation years that effectively add an additional year to the length of study. In this way, significant numbers of students have, for example, been admitted to degrees in science and engineering, and similar programmes are planned in economics, management, and education. The first years of these programmes are presented on the university's Mamelodi campus. These programmes are currently important; nevertheless, as the South African schooling system normalises to ensure that all learners are given fair opportunities to develop and demonstrate their intellectual abilities, the emphasis on extended programmes will diminish.

In order to retain good students and create conditions under which they are likely to be academically successful, UP will provide appropriate academic and other student

support to all students, including postgraduates. It is also the institutions intention that no student with academic merit will be denied access to the university for want of financial means.

UP aims to provide students with a strong and balanced academic education that equips them, among others, with life skills, based on universally accepted values. Furthermore, UP students are encouraged to enjoy the holistic education that the opportunities on the campuses make possible. In particular, as a centre for creating new knowledge through research, UP aims to foster a state of mind in their students that is both inquiring and entrepreneurial.

Many students choose to live in the university's residences. Regrettably, not all who apply can be accommodated. The university intends to increase its residence capacity so as to maintain, at least, the existing ratio of available beds to total enrolled students as the university grows. This may require alternative models of funding, accredited public–private partnerships, and differentiated accommodation fees, to allow for an anticipated target of 25% of students in university accommodation. All residences will commit themselves to developing a culture of learning, based on the university's core values (UP Strategic Plan 2025, p. 15).

Furthermore, the 'total experience' of students at a large residential university demands that UP creates a stimulating environment that is conducive to study and scholarship for all students — those in residences and day students. To this end, the university will continue its support for faculty- and day houses. It will also develop student centres where day students can study between lectures, and a sense of community and peer support can be fostered.

Table 117: Students goals and strategies.

Goals	Strategies	Performance indicators
Attract and select the most talented students to the University from all SA communities on the basis of academic merit	1. Use both school-leaving results and additional assessment to identify students with high cognitive ability and intellectual interest	- Distribution of academic points scores (APS) of first-time entering students - Success rates in entrance assessments
Increased diversity in terms of race, gender, social class, and language preference	1. Actively recruit students across the spectrum of urban and rural areas	- Student diversity profile (% black , female, international, Afrikaans students) - % regional and international students
Create conditions for successful study	1. Provide financial aid to deserving students from poor backgrounds 2. Provide residence accommodation as far as possible	- Student financial aid as % of student fees - % students in university residences - % students in day houses
KEY TARGET: identify, recruit and admit top-performing school-leavers nationally, on the basis of their school-leaving results and/or performance on entrance assessment.		

Source: (UP Strategic Plan 2025, p. 11).

6.13.5 UP Academics

Academic work is done by people and therefore, to a large degree, the reputation of a university depends upon the quality of the staff that it can attract and maintain. In turn, good staff attracts quality students. The following will enable the university to attract and retain a representative body of excellent academic and support staff members:

- appointing members of staff on merit, including the potential for excellence;
- pursuing the university's employment equity plan by actively searching, in SA and further afield, for members from designated groups; and
- actively identifying and rewarding academic excellence and intellectual innovation in all its manifestations.

As a research-intensive institution, all the university's academic members of staff will be expected to be research-active or to be engaged in creative outputs as part of their normal performance. In order to increase the output of research, the university will investigate ways of improving the ratio of students to academic staff.

Table 118: Staff goals and strategies.

Goals	Strategies	Performance indicators
Attract and retain excellent academic and support staff	1. Active recruitment of academic staff through a range of national, regional and international networks 2. Flexible HR policy 3. Attractive work environment and excellent facilities 4. Active recruitment of support staff	- % staff with higher degrees - % permanent staff - % staff resignations - Academic staff: number of NRF-rated scientists appointed
Establish a diverse corps of staff	1. Targeted funding to achieve research excellence 2. Incentives and awards for success	- Employment Equity targets - Diversity of staff composition (per department)
Decrease the student : academic staff ratio in key departments	1. Increase expenditure on academic staff 2. Increase academic appointments in key departments	- Academic staff expenditure as % of total expenditure - Differentiated student : staff ratios
KEY TARGETS: doubling the current number of NRF-rated academic staff members		

Source: (UP Strategic Plan 2025, p. 14).

Universities need to focus on two fundamental functions: research and teaching. The links between these functions are protected in legislation. Knowledge creation or research and the transfer of knowledge, teaching, are mutually dependent (Education Act 1989, Section 162(4)). Academic institutions are autonomous, and academics have academic freedom (Section 161(2) of the Act), meaning that academic staff can engage in research guided by their specific disciplines, and enlighten their teaching practice through the scholarship of teaching and learning, devoid of unjustifiable interference. Academic staff activities are framed and informed by obligations to and functioning in these functions (Houston 2003, p. 18).

Tensions between research and teaching are a reality with respect to the demands on time, as well as reward and recognition, leading to either synergy or competition exacerbating any tension. To circumvent hypothetical adverse consequences and activities, Jenkins argued that research-, teaching-, and community expectations, as well as those of awards associations, have to be described and managed at various levels, such as the institutional, departmental, and individual level (Jenkins 2004; Houston 2003, p. 17).

The knowledge economy has directly affected the workload of academics. Coaldrake and Stedman (1999, p. 9) remarked that individual academics have acted on the expanded expectations through 'accumulation and accretion rather than adaptation.' Academic staff is intrinsically motivated by the importance of external 'academic, discipline-based recognition by peers' and the factors in the relationship between teacher and student (McInnes 1999; Meyer & Evans 2003). Academics engage in their fundamental activities, such as 'critical thinking, reflection, and collegial interactions' within the framework of disciplinary interests and expertise challenge, variety, and autonomy (Winter, Taylor & Sarros 2000).

Academic staff responses are as complicated and varied as the demands placed upon them. These responses are guided by the values these academics bring to their work. Flexibility and autonomy are central qualities of academics employment. Their work is executed with the expectation that their allocated workload is increased by principles of equity and transparency (Burgess *et al.* 2003; Soliman 1999). Departmental managers are critical to this process, by ensuring a climate of transparency and collegial sharing of information.

In doing the research academics in their dialogues revealed an unexpected absence of problem-solving or creative thinking. Certain personnel had withdrawn into a culture of blame, instead of addressing the issues related to workload. They have become progressively more narrow-minded, further decreasing successful communication to solve problems. This attitude was also associated with reports that research time had to be compromised in favour of teaching and administrative duties. Doring (2002) postulated the likelihood that academics surrender to perceiving themselves as casualties of change, instead of as change agents. It is the responsibility of academics to shape their role and academic work profile.

6.14 ACADEMICS' RESEARCH-TEACHING NEXUS

Universities are unique in that they need to focus on twofold fundamental functions: research and teaching (Romainville 1996). The links between these functions are protected in legislation describing the concern of universities with higher education

learning. Knowledge creation, research, and knowledge transmission or teaching are mutually dependent, with academic staff functioning in progressing knowledge (Education Act 1989, Section 162(4)). HEIs are autonomous, and academics have academic freedom (Section 161(2) of the Act), meaning that academic staff can engage in research guided by their specific specialities, and enlighten their teaching practice through the scholarship of teaching and learning, devoid of unjustifiable interference. The activities of academic staff are framed and informed by obligations to and functioning in these functions. (Houston 2003, p. 18).

Tensions between research and teaching are a reality with respect to the demands on time, as well as reward and recognition. Jenkins *et al.* (2006) noted that this reality could either lead to synergy or competition, exacerbating any tension. To circumvent hypothetical adverse consequences and activities, Jenkins argued that the research, teaching, community expectations, as well as awards associations, have to be described and managed at various levels, such as the institutional, departmental, and individual levels (Jenkins *et al.* 2006; Houston 2003, p. 17).

The knowledge economy has directly affected the workload of academics. Coaldrake and Stedman (1999, p. 9) remarked that individual academics have acted on the expanded expectations by accumulation rather than adaptation (Houston 2003, p. 19). Academic staff is intrinsically motivated, but the importance of exterior 'academic, discipline-based recognition by peers' and the components in the relationship between teacher and student must not be undestimated (Meyer & Evans 2003). Academics engage in the fundamental endeavours of 'critical thinking, reflection, and collegial interactions' within the framework of disciplinary interests and know-how, variety, and autonomy (Winter, Taylor & Sarros 2000).

Academics reactions remain as complicated and varied as the requests presented to them. These responses are directed by the values these academics bring to their work. Flexibility and autonomy are central aspects to their employment, which they do with the probability that their workload allocation is strengthened by values of equity, as well as clarity (Burgess *et al.* 2003). Heads of departments are critical to this process, as they have to ensure an atmosphere of clarity and collegial sharing of information. Academics

acknowledged an absence of problem-solving or creative thinking by them (Houston 2003, p. 27). Certain personnel had withdrawn to an attitude of a “culture of blame,” instead of addressing the issues related to workload. They became progressively more narrow-minded, further decreasing successful communication in solving problems. It had been reported that academics also compromise time spent on research, in favour of teaching and managerial responsibilities.

The global market-driven economy benefits from HE by way of the skilled workforce it produces and the innovation of products, as well as enhanced social integration and diversity through raised demand for access to HE (Menon 2003). The culture and experiences of students has fostered a market-driven educational system (Johnston 2004). HE environments constantly change, and make it difficult to balance traditional values with new demands such as target-driven performance assessment and financial independence (Lomas 2006). The aim of education in a knowledge-driven society is to develop undergraduates to think like experts by introducing research-led, research-orientated, and research-based teaching (Menon 2003) in undergraduate syllabi (Healey 2005; Griffiths 2004). Research, a scholarly activity, is perceived to be superior to teaching, and it is imperative for institutions to fortify the nexus. Institutions need to reward excellence and innovation in teaching through awards and funding (Karagiannis 2009, pp. 76-77).

Factors that affect the transformation of the academic profession are:

- diversification and specialisation;
- increased control over academic tasks as universities take on attributes of employers. Academics’ work is defined by professional groups and institutional work arrangements (which erodes academic freedom) (Musselin 2007, pp. 1-8); and
- The research-teaching nexus relates to the relationship between discipline-specific research and student teaching and learning. This merges the effect of institutional, government-, and academic departmental policies on the configuration and superiority of the association between research and teaching (Karagiannis 2009, p. 75).

6.15 CONCLUSION

Throughout the literature review, the concept of innovation adoption was interpreted from an interactive triple-helix perspective, encapsulating the university and its students and academics, the South African economic setting that influences the social environment, and the political environment, highlighting government's perspectives and expectations, as it is embedded, rather than explicit within the HE context (pp. 58, p. 427, p. 429). This systemic university–industry–government view was a sufficiently complex dynamic to guide the researcher heuristically in analysing innovation adoption in a knowledge-based economy. Industry strives for wealth creation through entrepreneurship, specialisation, and productivity in the labour market, leading to higher tax revenues and increased spending. Academia develops human capital, and generates the necessary learning and abilities needed to address the numerous disputes of SA's developing economy. They need to deliver graduates with the right attributes, leading to employability, while also serving a social responsibility agenda in an epoch of intense complexity. Government interacts with both sectors, and funds academia according to its growth and social responsibility agenda, while setting the governance rules and regulations for industry and securing FDI. All three sectors are responsible for research and development in an increasingly arcane world facing difficult questions and competing priorities. These interactions should result in poverty reduction, economic growth, and job creation. As was highlighted in the literature review, this interaction results in cautious equilibria between differentiation and integration amongst the different functions. All three entities are striving towards helping citizens, organisations, and governments to understand and manage the information that society's learning challenges. This perspective alludes to the increasingly interlaced relationship between the formerly insulated institutional social realms of university, government, and industry.

The systemic view is further complicated by a global layer, in which the triple-helix perspective is located. Competing in a global knowledge economy necessitates that the data are analysed by taking into account an outer layer with a major influence on the theoretical framework. An important indicator for institutions is their global ranking. The indicators used to rank institutions either support or contradict the local expectations of the institutions. For example, academics compete on a global platform, as their individual or

collaborative research and publications are peer-reviewed and published internationally, postgraduate exchange programmes need to be on par, and students expect their qualifications to be recognised internationally, as some graduates have the opportunity to gain experience or employment overseas.

The concept of person–organisation values fit is at the core of the gap in academic identity that exists in the ‘academic identity’ rift between ‘academic manager’ and ‘managed academic’ (Winter 2009, p. 121). The extent to which the ideologies and values of academics are not harmonised with the current dialogue on corporate managerialism, leads to academic disengagement. Many academics are debating the issue of how they can achieve a meaningful relationship with their institutions in an environment of resource constraints and business development. The principle in this instance is that both the values of the institution and those of the academic need to be understood and adhered to, in order to facilitate change (Winter 2009, p. 129).

Chapter 6 dealt with factors external to UP that have an influence on the agency of academics in the institution, including their ability and orientation to adopt innovation. The main influencing factors identified in the chapter were the shortfall in government funding, an uneducated workforce, pressure to improve UP’s world ranking, and the electricity crisis. Even though these factors have no direct bearing on the daily activities of academics, they create the environment, as well as the rules, within which academics work. Resources are aligned to the funding framework of government, in line with economic policies, to achieve social justice and to meet the expectations of constituents. UP’s response affects the actions of academics in relation to innovation adoption.

The identified external factors are summarised in Table 119.

Table 119: Summary of identified external factors.

External Factors		
Categories for grouping factors	Factors	Impact on academics
Global trends	<ul style="list-style-type: none"> • Economic trends and impact on SA • Human capital skills levels 	<ul style="list-style-type: none"> • Informs the programs/content needed to build the economy and attract foreign investment;

	<ul style="list-style-type: none"> • International ranking • IT development • International partnerships • Research 	<ul style="list-style-type: none"> • informs research topics • Curriculum development • Internationalization • Adoption of technology in T and L processes
Political layer	<ul style="list-style-type: none"> • Small group of middle class versus large poor group • Welfare and service delivery • Electricity supply • Low levels of entrepreneurship – growth policy • Foreign direct investment 	<ul style="list-style-type: none"> • More students and less money – development policy of Government • Influences contact/study time – UP needs to work differently • Students that graduate needs an entrepreneurial orientation • Government policies influence investment and opportunities / power supply in country
Economic layer	<ul style="list-style-type: none"> • Labour market productivity • Low savings rate • Economic growth • Communication infrastructure • Conflict between private sector investment-led and state-led growth path 	<ul style="list-style-type: none"> • Job creation by graduates • Influences HE budget allowing for massification • Internationalization • Internet use / bandwidth availability • Appropriate graduate attributes • Enhance sophistication of businesses through graduate participation
Social environment	<ul style="list-style-type: none"> • Massification of HE • Poor schooling widening gap between school and HE • Poorly schooled • Crime 	<ul style="list-style-type: none"> • Hybrid modes of teaching • Transitional programmes and admission requirements • Resource-rich learning environments and academic development
Higher Education level	<ul style="list-style-type: none"> • Mismatch between output of HE and needs of the economy • Funding • Build technical and vocational education and training 	<ul style="list-style-type: none"> • Student success • Raise private funds • Develop teachers • Conduct research
HE world ranking	<ul style="list-style-type: none"> • Measure, validate and quantify performance 	<ul style="list-style-type: none"> • Academics research • Throughput • Staff-student ratio • Innovate
SA Graduate output	<ul style="list-style-type: none"> • Numbers, equity and proportion that is successful • Strategic plans of institutions not aligned with academics realities 	<ul style="list-style-type: none"> • Be more responsive • Better communication between academics and management

Source: (Own compilation from literature).

This chapter concluded the literature review. The following two chapters will present the data analysis and uncovering the factors that affect innovation adoption by the UP academics (units of analysis).

CHAPTER 7: DATA ANALYSIS OF FACTORS AFFECTING INNOVATION ADOPTION

7.1 INTRODUCTION

This chapter presents the identified factors affecting innovation adoption, captured from the data. All the factors that have been identified in the literature that influences innovation adoption are shown in the theoretical framework in Figure 76. The factors influencing innovation adoption, within the UP context, as identified by the academics who participated in the study, are presented in this chapter.

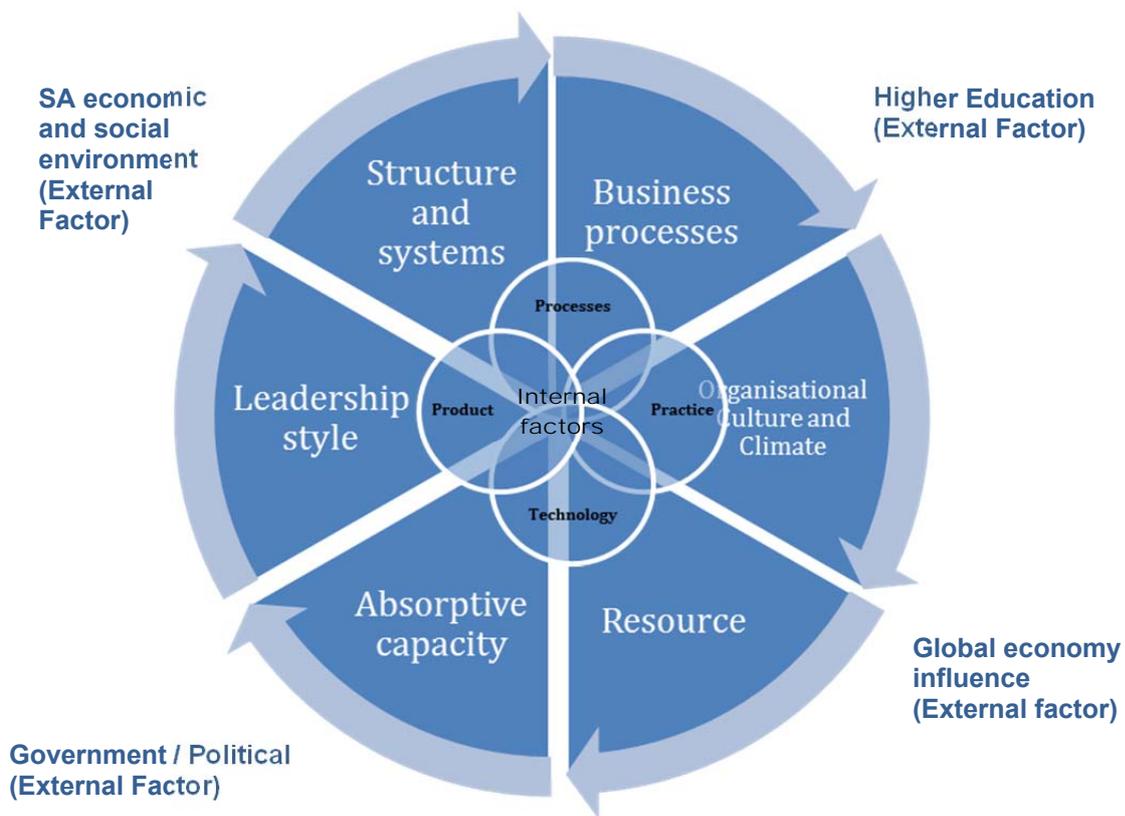


Figure 76: Factors affecting innovation adoption.

Source: (Own compilation).

The issue of innovation has encouraged extensive research designed to clarify why particular groupings or individuals are more prone to innovate than others (Amabile 1996). This research presented here identified factors that encourage or discourage the

adoption of innovation in the working environment of academics at UP. The literature review highlighted that innovation drives effective performance, which is affected by:

- an entrepreneurial strategy to stimulate innovation, which is underpinned by risk-taking, a pro-active approach, and commitment (pp. 51-53, p. 57; pp. 62-64, pp. 68-69, p. 70);
- an organic structure leading to flexible collaborative efforts, facilitated through consultation (communication) (p. 144; pp. 151-152; p. 199; p. 223; p. 252; p. 263; pp. 256-257, p. 268); and
- synthesis, realised through integration between departments/faculties as a basis for success (p. 117, p. 163, p. 224).

This chapter considers the internal factors, identified by the research participants in the present study, that affect innovation adoption. The results of this qualitative case study relied on an interpretive constructivist epistemology. The HE and institutional context in which these academics are active was highlighted in the literature review, as it significantly impacts their innovation adoption ability (pp. 333-341)

7.2 DATA ANALYSIS

From the literature the internal factors that affect innovation adoption highlighted in the literature review were:

- the structure and systems of the institution;
- the differentiation between a strategic level (what and why) and an operational level (how) within the institution;
- institutional culture and climate;
- institutional, faculty and departmental leadership style;
- absorptive capacity;
- business processes of the institution, faculty or departmental; and
- institutional resources.

These internal institutional influences were used in the case-study to analyse the concept of innovation adoption within the UP context and are depicted in the theoretical framework in figure 76.

The data analysis plan for this research was as follows. The qualitative data analysis followed the path described in Table 120.

Table 120: Data analysis plan.

Qualitative data	
Data collection method	Semi- structured interviews were conducted to capture narrative data. Questionnaires complemented the interviews as well as documents from participants.
Data recording	Individual meetings were held with all participants. . Data recording was realised through making notes and compiling a summary of responses captured in word and/or excel format
Verification and evaluation of data	The researcher familiarised herself with the data by reading the captured data (notes) consecutively and combining all the sources at hand.
Approaches used for analysis	Organised data by topic, themes and subthemes across all respondents. Themes and sub-themes of innovation adoption were identified beforehand based on theory in literature review, where after data was grouped under these themes. Emerging themes and sub-themes were captured whilst analysing the data until data saturation took place.
Approaches used to code and summarise and further analyse the data	Themes and categories were labelled through specific coding, identifying themes and subthemes. A table of key points and important findings were compiled while categorising and sorting data

Source: (Leedy & Ormrod 2005, p. 49).

The analysis was completed by organising data according to specific topics or themes across respondents' feedback. Practices were identified based on the existing theory, and data were grouped under these themes. Emerging themes were captured whilst analysing the data, until data saturation had occurred.

Coding, summarising, and further analyses were conducted: specific coding was used to identify themes and subthemes. Key findings were listed while categorising and sorting data. Findings and results were based on relevant facts, avoiding generalisation.

Credibility was ensured by keeping record of data for cross-referencing (Leedy & Omrod 2005).

The data analysed were qualitative in nature. The themes that were extracted from the primary codes are discussed to reach an understanding of the factors influencing innovation adoption in UP. The key points, tabled as 1st-level codes and clustered into thematic subthemes, are reflected in Appendix A.

7.3 CONTEXT WITHIN WHICH RESPONDENTS WORKED

The variation in the context of the respondents gives rise to different interpretations of innovation. These variations in context are given in Table 121.

Table 121: Summarised context of academics involvement.

Faculty	Department	Level of students	No of students	Class combination
Humanities	Drama	2nd year	70-90 students	Drama and non-drama
Economic and Management Sciences	Marketing	Honours (4th years).	54 students	Male, 44 Female Mixed class all races
Veterinary Science	Production Animal Studies	5th year	140 students	70% female. +/- 80% urban back-ground
NAS	Consumer Science; Clothing Merchandising	4th year	SA students: 28-32	The majority of students are white females, with 3-5 black/mixed race students. Only 2-3 male students. Virtual teams of 7-8, mixture of students from different culture based on the country of residence (i.e., America. n, Australian, and South African), other international students from Indonesia, Japan, China, India, and Malaysia
EBIT	Engage extended program		350 students	40% white (Afr and Eng) 60% African and Indian
Health Sciences	Physiology Neurophysiology	2nd year	220 students	Mixed class all races
	Exercise Physiology	3rd year	70 students	
Economic and Management	Marketing	B.Com (Hons)	54	Approximately 10 males and 44 Females, Approximately 10 African, 3 Indian and the rest

Sciences				Caucasian
Education	Humanities Education	2nd years	730 students.	Mixed class all races
Economic and Management Sciences	Marketing and Communication Management	Honours	60 students	Predominantly white females, with fewer males and students of colour.
Faculty of Law	Procedural Law	Law Clinic	typically more than 50 and less than 100	English and Afrikaans groups and we always have and encourage diversity. Race percentages vary from year to year, but we consistently find significantly more female students than male. We have combined students in the subject.
Health Sciences	School of Health Systems and Public Health (SHSPH)	5 th year medical curriculum	200 students	National diversity in terms of race and gender
Library Services	Library orientation	1st years	8000 students more or less 60 per class	National diversity in terms of race and gender
Economic and Management	Department of Auditing and Department of Communication Management Internal Auditing	BCom Honours	+/- 90 students	65 % African, 5% Indian, Chinese, 30% White

Source: (Compiled from data collected).

Academics' circumstances within a department may change every year, depending on what teaching allocation is given to a lecturer. This focusses attention on another challenge — the sustainability of innovation. Respondents highlighted the fact that innovation is dependent on a specific person:

- 'innovation is mostly reliant on the individual driving the initiative';
- 'innovation is done on an ad hoc base';

- ‘innovation is more driven by an individual and, to a lesser extent, processes. We do not have a change process. Innovation is handled at [sic] an ad hoc basis, driven by the individual that wants to innovate’; an
- ‘I found it to be not very supportive, and it seems a lonely road’.

When a person innovates and his or her responsibilities change, a legitimate concern exists that the innovation will not be sustained.

7.4 FINDINGS ON ACADEMICS’ UNDERSTANDING OF INNOVATION

The first step in answering the research question was to acquire an understanding of how academics perceive innovation. Understanding their awareness of innovation, crystallises their experiences and led to answers to the research question. The responses of the participants were varied, depending on their faculty/department, their seniority in the faculty/department, as well as the responsibilities assigned to them. One clear principle that was at the heart of their responses was the interests of their students, evident from responses such as:

- ‘... in order to truly be innovative in education, it is, at times, necessary to break away from the conventional, while at the same time keeping the best interests of students in mind’;
- ‘... inspire students to become involved with and participate in the subject that I teach. You need to be passionate about your subject and about how your students are experiencing it. If it does not matter to you, it won’t matter to them either. The trick is to get them on the ‘bandwagon,’ so to speak, with you, for then you both begin to care about the same thing, and it matters to both you and your students, and teaching becomes a shared learning experience not to be missed for anything’; and
- ‘...want to be the best at what I do; assist students as well as I can. It seemed intuitively obvious. I guess, I often also ask myself, ‘What subject do I wish I had as a student?’ and then I try to create that subject’.

The nature of academia is enquiry-based. This characteristic shapes the understanding of the concept and denotes meaning, as is reflected in the responses defining innovation:

- ‘... the constant enquiry into the relevance of what I am teaching and how effective it is (from a teaching point of view)’;
- ‘...using new tools to do something, although these tools need not necessarily be electronic devices, computers or such, which some people now see as synonymous with the term innovation’;
- ‘...re-conceptualising, re-designing, and re-defining old ways of teaching, creating something new and original to make an impact, ...challenging the system of old thoughts, ... a necessity to get students ready for industry’; and
- ‘...implementing something new, different, and ingenious in order to improve on existing ways of doing’.

These understandings are framed by their role as teachers, and are driven by the research- and teaching–learning nexus. Teaching and research are two distinct capabilities, and, in UP, it is assumed that academics will perform well at both. The reality is that research competes with teaching for the time and effort of the respondents. The respondents need to negotiate their respective weights for research and teaching with their line managers, as prescribed by the performance system, and it is assumed, but not necessarily a reality, that, if the weight for the one is increased, the weight for the other must necessarily decrease. The tension between teaching and research is evident in the process innovation of academics’ teaching practice.

The changing environment in which HE is situated acts as a catalyst for innovation, as academics need to think differently and introduce changes to cope with these challenges. These changes are perceived as innovation in their influence sphere, as is evident from the subsequent responses:

- ‘...necessity behind educational innovation is to accommodate the widened participation agenda, and create a sense of career direction or career path for those countless ambiguous students; to expose students to integrated modules and courses which make way for practical application of skills and knowledge whilst simultaneously increasing prospective career opportunities and community upliftment projects’; and
- ‘My realisation that our society is in flux, still grappling with tragic racist history; experience in Germany provided ideological roots. I tried to imbue my students with

self-assertion by contextualising material in own language and culture attempted to show them this by no means inferior to English”.

Pressure is put on academics in UP to cope with the combination of the range and quality of the institutions programmes and the institution’s size, while positioning the institution as a leading producer of quality graduates for the national and international marketplace. This pressure frames what academics perceive innovation to be in relation to their teaching.

7.5 FINDINGS ON ACADEMICS MOTIVATIONS TO ADOPT INNOVATION

As a very large institution, much of what and how academics innovate is faculty-based. To cater for the epistemological diversity of disciplines and the desired outcome expected from qualifications, the motivation for academics to innovate is similarly diverse. It can be deduced from the responses that staff will identify productive methodologies appropriate to their situations, to innovate or not to innovate but if people cannot see innovation happen within a realistic time frame, they become despondent.

- ‘..the lack of interest and commitment shown by students in the course; own dissatisfaction that I did not know how to change the situation and motivate and inspire students to take the trouble to explore and discover the treasures in Greek tragedies; addressing poor attendance and interest led to new outlook on the subject from the lecturer’s point of view and new style of teaching – students became collaborators and experts in their own right and distributors of knowledge they had researched for themselves’;
- ‘..challenging the students outside of their own ‘comfort zone’; questioning assumptions to do things differently; to adjust as the environment changes; research, industry input and international trends is motivating leads to new curriculum design’;
- ‘...desire to make a difference in responsible position (course co-ordinator); had true desire to change the way we teach concepts that are traditionally seen as boring and difficult; students do all the studying and research on their own, and the co-ordinator directs project’; and

- ‘...criticism about Faculty’s poor ability to stimulate the interest of our students in rural practice; another factor was the idea of a reality project to grasp the imagination of new generation of students (team competition similar to “Survivor”); collaboration and camaraderie resulted in stimulating the interest of students and their general learning experience; develops’.

Some lecturers are intrinsically challenged, and, by their nature, want to excel. They are motivated to innovate because they are achievers, and are not deterred from taking risk. They are exposed to new ways of doing or thinking, and then experiment in their environment.

- ‘...it was exciting and the value of the project exceeded these challenges; multinational virtual teams rely on computer-mediated rather than traditional face-to-face communication’;
- ‘I enjoy developing solutions to practical problems or inefficiencies experienced wanted to do things “simpler, better and faster”;
- ‘..it is recognition for effort; more responsibility, new module, games and exhibitions of student work’; and
- ‘...personal dissatisfaction with the content and structure, plus the fact that the teaching was all classroom-based therefore not contextualised for learning about health systems and poorly attended; module was not meeting the learning needs of the target audience — highly intelligent senior medical students who are critical and whose opinions are valued’.

From these examples, one can deduce that academics adopt innovation in line with their personal values and orientation.

7.6 ABSORBTIVE CAPACITY

The UP policy for appointment and promotion makes provision for the minimum qualifications an academic should have acquired before being appointed at the institution as a lecturer. All the academics that participated in the present study were highly qualified, with experience in their disciplines. Some lacked formal training in HE, while

some completed the Post Graduate Diploma in HE (PGCHE). It was noted that there is more emphasis on research and postgraduate studies than on innovation at undergraduate level.

The institution also appoints academics on a part-time basis. This influenced the commitment to change and innovation, as was raised by one of the participants, who stated that she had been ‘...recently appointed in a full-time, permanent lecturer position,’ after she was on contract for 13 years. Other sources of learning and inspiration included:

- learning from experts;
- brown bag lunches (lunch time training opportunities) that stimulate creative thinking;
- university priority courses (UP continuous professional development opportunities that are not charged) provide opportunity to learn;
- various seminars throughout the year on teaching and learning practices and assessment methods;
- international peers;
- books; and
- short courses.

Support was available from CEatUP (Continuous Education at University of Pretoria) and the DEI. Some lecturers had received financial assistance, which enabled them to innovate.

7.7 FACTORS AFFECTING INNOVATION ADOPTION

The data from the participants were captured, and first-level codes generated, from which thematic subthemes were produced. The result of this process is captured in Table 122.

Table 122: Thematic subthemes from data.

Thematic Subthemes
Value of innovation.
Innovation success / Innovation orientation.
Determinants / elements of innovation.
Foster innovation.
Innovation tools.
Personal characteristics leading to innovation adoption.

Absorptive capacity of individual; Employer ranked remuneration, rewards, benefits as the most important drivers while employees ranked having the skills and resources needed to do job properly – there is a disconnect) (Best company survey, 2009 – engagement drivers).
Benefits / rewards for innovation adoption.
Challenges to innovation adoption.
The structure and systems of an organization influencing innovation adoption; Formal gives leverage – critical, positions one / Informal – ‘wavelength’ authority.
Organisational culture influencing innovation adoption.
Organisational climate influencing innovation adoption.
Leadership influencing innovation adoption.
Business processes influencing innovation adoption.
Suggestion to enhance Innovation adoption.
Discourse of labour economics.
Lessons learnt / experiences through innovation adoption.

Source: (Compiled from data collected).

The thematic subthemes are elaborated on hereunder.

The value of innovation adoption was emphasised by respondents. One respondent stated: ‘It emboldens you to think in a challenging way,’ and ‘I am a firm believer in changing as the environment changes and due to market changes.’ Adopting innovation challenges an academic to think differently about his or her discipline, and to create rich environments in which students can learn. Innovative thinking and being exposed to innovative, new ideas are essential, because these serve as the ‘seeds’ for one’s own (the students’) innovations. The respondents believed that an academic will not be able to address the changing needs and expectations of various stakeholders, such as students, employers, practitioners, government, etc. without innovating. The importance of innovation is underlined in the vision and mission of some support departments. The value of innovation is perceived as the progression towards more satisfying and meaningful academic practice.

Innovation adoption in HE is needed to bridge the gap between senior certificate training and HE for students. HEIs should follow a more holistic approach in terms of life skills, transferable skills, entrepreneurial outlook, and handling and overcoming challenges to prepare students. Such an approach does not only focus on the knowledge it transfers to or instils in students, but focuses more on getting students ready to work in any industry. The value of innovation adoption by academics can be measured in students success and when they are successfully employed in the job market. The value of innovation adoption

is also proven in that some of the skills and knowledge obtained by students is evident and useful for them in their daily activities. Students will only be able to function effectively in the world of work and contribute to resolving the many challenges of our society if they are taught and encouraged to innovate. The value of innovation adoption is extremely significant to students, and many students are returning to the HE environment for postgraduate studies.

Innovation adoption can enhance knowledge transfer and lead to an improvement in students' academic achievement. The integration of teaching and learning approaches suggest 'flexible learning' that delivers learning options that are better aligned with the learning needs of students. This blended educational approach allows for widened participation of students, thus making way for local, national, and international involvement. Technology allows for resource leveraging and knowledge sharing. The reward for an academic adopting innovation is reflected in the following words of a respondent: 'Innovation was a good experience, and it made me feel that I made a difference when you can break loose from a traditional method of doing something and start a new way of reaching the same or a higher goal.'

Innovation is perceived as something that cannot be planned, structured, or forced, but can, at best, be stimulated and nurtured. It starts with an innovative mind-set, where an individual recognises an opportunity, problem, or inefficiency that requires change. The individual has to be motivated enough to act to change the status quo. Innovations that are self-initiated work best, because the people involved take ownership and want change to happen. One respondent was gratified when she realised that she had stumbled upon innovation by accident. Innovation comes from inside the innovator. Another respondent thought that innovation was a state of mind that is often supported by new technology, and the use thereof in a curriculum could help.

A determining factor for innovation adoption is a burning desire (passion) to imbue students with enthusiasm and a consuming dissatisfaction, and a deep desire to change that which does not work. Creative environments, challenges, and training are needed to support academics who are intrinsically motivated. Academics also need to adapt to society's changing needs, and be open to change at all times.

Innovation adoption is perceived as a trait, rather than a skill. Some people are natural innovators, and will always try new methods, with varying levels of success. They are open and flexible, and learn from their mistakes. Innovation adoption is seen as incremental innovation building on previous successes through trial and error, finding things out the hard way. This relates to the action research methodology of academics. The use of tools, not necessarily electronic devices, computers or such, is seen as synonymous with innovation.

Innovative ways of thinking is critical to being a successful academic. Without innovations in teaching, research, and community service, an academic will not be able to address the changing needs and expectations of various stakeholders — students, employers, practitioners, government, etc. Certain characteristics associated with academics who adopt innovation were identified. These include:

- a positive attitude;
- enthusiasm;
- a creative mind-set;
- openness to change;
- a philosophy of continuous improvement and competency development;
- a sense of agency;
- personal values;
- personal motivation;
- mobility in thinking;
- a willingness to experiment and learn;
- involvement and willingness to collaborate;
- an ability to change;
- following ones' heart;
- perseverance;
- a genuine aspiration on the part of the lecturer; and
- always being intrigued by new workshops and support offered by UP.

It was highlighted that it is important to use the most appropriate teaching methods, aids, and techniques, rather than just using something different so that you can claim that you innovated.

The reason for any adoption or change is important to academics. A catalyst for innovation is exposure to alternatives, either through reading articles, attending conferences, enrolling for international short courses, or international exposure. Collaboration with industry partners and like-minded academics stimulates innovation adoption. Studying new information on and approaches to education innovation can also ignite interest to change. Innovation adoption in an academic environment is often driven by the individual with an orientation of constant enquiry into the relevance of what they teach and how effective his or her teaching is.

Watching and observing students and the new trends as they present themselves, and thinking of ways in which these can be employed or harnessed, fosters innovation adoption. This necessitates that academics constantly change or adapt their class notes, study guides, and presentations to new ways or current trends. Reflection on their own teaching and research practices and regular discussions with peers, experts and a variety of other stakeholders, such as practitioners, alumni, and researchers, allows academics to change direction. By actively considering their beliefs or supposed forms of knowledge they could arrive at new ideas through inference.

Some examples cited by respondents to display innovation adoption by academics were:

- The implementation and assessment of student progress with the introduction of new technology (e.g. a reading programme) followed by essential discussions by students. In this example the SA government decided to cancel Latin as a pre-requisite for a law degree, and also discontinued the subject in secondary schools. Following this decision, the innovation that was adopted through a communicative approach by the academic, was aimed at improving writing, speaking, reading, and listening skills;
- One respondent had been appointed as the course co-ordinator of a module, and wanted to make a significant contribution that could change the way that certain aspects are taught, as criticism was often heard from the rural practitioners that the faculty was not stimulating the interest of students in rural practice. This is an example of how academics' responsibilities stimulate change, leading to the adoption of innovation. Not having your own classroom but sharing lecture halls was a challenge faced by one respondent. The respondent was also challenged by very large student

numbers in an ineffective course, where the necessary skills were not being addressed;

- It was noted that, in one faculty, there was little, if any, structured attempts at teaching students how to be innovators. Modern-day student attendance at the 7:30 class was very poor, with students citing lack of interest and stating that the subject is difficult to understand and boring. The solution was to create a simulation of reality, which ignited a new teaching model. The respondent therefore incorporated client-based as well as in-class challenges for students to interact with the knowledge they have about the subject and, at the same time developed managerial skills necessary in industry;
- An additional example of how academics were challenged is the five-year programme (5YP) offered by UP in the Engineering Faculty that did not provide significant results in terms of student success and retention. Funds became available in a DHET foundation grant to explore and implement a new augmented model — the Engage programme. This was a break from the conventional, while, at the same time, keeping the best interests of students in mind. Grounding and passion for education leads to trying to create the best experience, as students are clients and want to be the best. They want to win and to give their best;
- The clothing industry had changed dramatically over the last ten years. The industry is fast-paced, changes constantly, and is also dispersed. Globalisation and the nature of retailing (supply chain) forces companies to operate in different countries simultaneously. This necessitates interfaces and collaboration over organisational and geographical boundaries between workers. Retailers are looking for students who are skilled and have product knowledge, and who can handle the pace while working under pressure. The lecturer, explored opportunities and ways to create and incorporate the nature of the clothing and textile industry with the courses being taught, in order to enhance students' learning by emulating the workplace. This contributed to the professional and personal development of the students, and better equipped them to join the workforce;
- Another challenge mentioned was the TEARS approach, which aims to put a career- and research focus in education. Within TEARS, the theory was restructured to be more career-orientated, and was altered to the CEatUP programme format. Education (including lectures, practicums, and assignments) was presented in an interactive manner to encourage student participation and enhance learning. The career-

orientated theory was applied by involving students in community projects, where they participated in the fitness, wellness, and sports vision testing at several Investec International Academy training sites and three gyms established for rural communities, all under the supervision of postgraduate students. The data that were obtained from the testing were then used by the students under the guidance of postgraduate students for research-, degree-, and publication purposes. The TEARS principle satisfied the requirements for education innovation in the way of education, careers, research, and community services;

- The need for internal audit graduates who have excellent communication skills, expressed by the Internal Audit Educational Partnership (IAEP) Advisory Board, contributed significantly to the decision to innovate. They realised that they had to change, at least, the postgraduate programme to include a hands-on, practical business communication course. An Advisory Board was established within the Department of Auditing to oversee the programme and to support the university's continuing efforts to provide excellence;
- Game-based learning was introduced to keep up with new developments in education. The Horizon Report 2012 predicted an explosion in game-based learning in the future. The 'chalk-and-talk' way of teaching struck the staff member as inefficient, ineffective, boring, frustrating, and useless, especially in a world where students are learning at an incredible speed, due to more stimulating, relevant, and connecting learning- and teaching methods;
- Dissatisfied with the structure and content of the contribution (course). After the PGCHE, the lecturer tried to use a service-learning teaching and learning strategy to bring about the change (in our module). The module had declined steadily over the intervening years, and was, at that time, the worst-rated module in the entire medical curriculum. Following a pragmatic approach, I realised classical philology was not contextualised in SA, and saw a dire need for support in students. There was also a lack of continuity in other courses. The lecturer also came to the realisation that our society is in flux, still grappling with a tragic racist history, and then tried to imbue in his student self-assertion by contextualising material in their own language and culture, in an attempt to show them that they (those who speak a black language) are by no means inferior to English.

Methods that academics highlighted as ways to adopt innovation include:

- generating a desire among the students, leading to change;
- challenges in class-based activities;
- group work/competition work/practical (hands-on) projects following a holistic approach, so that the students can see the bigger picture;
- experiential learning – ‘learning by doing’;
- soft skills development;
- experiential and collaborative learning;
- virtual teamwork in a computer-mediated environment;
- utilising academics who are not only knowledgeable in their academic fields, but who are also passionate about teaching and the development of student potential;
- involving competent, committed, and experienced course facilitators and programme co-ordinators;
- inputs from practitioners and academics;
- structured planning and implementation processes;
- obtaining funding to use external service providers when internal service providers cannot provide the service;
- applying the TEARS principle;
- using game-based learning software as an intervention tool;
- employing a service-learning strategy;
- reflecting;
- giving and receiving feedback;
- specialisation; and
- making work relevant.

Innovation is a reaction to stimulation from the workplace to ensure that learning programmes are relevant to the industry, add value for students, and better equip them for real-life challenges, to ensure that they are more employable. Most academics do not realise that they are innovative, because it is not their field of expertise, but, within their field, they read something or experience something and then decide to try it with their class. Training on technical terms will not necessarily affect innovation adoption. As a result of her exposure to innovation, one respondent based her innovation on the Rogers’ Innovation Model.

Academics are not formally trained to innovate, but, by reading articles on innovation and attending conferences, they are exposed to innovation. However, it is believed that training could assist academics to think differently and reflect on their teaching and research practices. This could be achieved by exposing them to different ways of doing things. It was suggested that workshops, presentations, or courses on innovation be introduced to help academics with more practical implementation. Exposure to academic service-learning while enrolled for the PGCHE assisted one respondent to adopt innovation.

Universities are not prescriptive. Academics have the freedom to develop their modules, and are not restricted in the content. An academic who is not open to change will not be interested in innovation, while other academics are self-motivators who like to do things differently. Even so, innovation adoption has become a necessity, as some of the strategies and performance indicators are prescriptive in the percentage of students that need to pass. Respondents innovated by trial and error, as stated in the response from one of the respondents: 'The first year, I also learnt how the project should work, and I also learnt a lot about the feedlot industry; it was a much better way for me to learn than by trying to study the information from a book.'

The structure and systems of an organisation play an important role in the innovation adoption ability of academics. In order for academics to adopt innovation, they need time, space, support, and recognition. This needs to be managed through the performance management system at the university, otherwise academics will not adopt innovation. Support is essential, as academics need encouragement to adopt innovation. Some academics see the system as an obstacle, and not a help. Criteria for the performance management system (including bonus allocations) need to reward innovation, not just student pass rates and research.

Certain structures in the university do not support innovation, notably finance and procurement. These processes have become so full of 'red tape' in the last few years that it stifles innovation in the institution. Innovation adoption is seen as a culture or a value by some. The checklist culture at UP needs to be addressed, otherwise it allows academics to merely pay lip service to things to which they are not committed and do not understand,

but to simultaneously equip them to pretend that they do or even believe that they do. Innovation is more a mind-set than a field with terminology.

Individuals may be hesitant to innovate if this is not encouraged by the organisational culture (which, in academia, is often resisted), and if time and other resources are not available to bring innovative ideas to fruition. At UP, academics are essentially encouraged to innovate in terms of their research, but much less so in terms of their teaching and other responsibilities. The challenge is to fight the status quo and the check-box mentality, and encourage people to recognise the importance of the question: 'What are we trying to achieve here?' Unfortunately, the answer often seems to be: 'To do as little as possible, not rock the boat, and do what has worked for hundreds of years', or they say: 'We should innovate so do something new' (with no analysis of whether 'new' with no purpose may be damaging). In other words, people do not want to do new things when they should, and want to do new things when they should not.

A culture of wanting to innovate and of recognising and celebrating innovation is important. At UP, it is left to the individual members' discretion to decide to innovate and how to approach it. Knowledge sharing and teamwork (interdisciplinary) must be encouraged, while a realisation that 'we have to make things happen ourselves' is also important. There is no formal process of innovation in departments. Innovations have largely happened in isolation, without the knowledge and involvement of other colleagues. One respondent added: 'My feeling is that we have what I can only describe as a paranoid management culture. Small mistakes are criticized much, much, much more than even great successes are praised or even acknowledged.' A conservative (in some regards) personal view on things is enforced, while creativity is not truly nurtured, and risk is avoided at all costs, or passed on to others.

To make innovation adoption a reality, the organisational climate needs to facilitate such adoption. The general staff structures and work ethics need to support innovation. Respondents felt that, in UP, everyone is left to his or her own devices to innovate. In one support department, a very positive attitude towards risk and knowledge sharing was found where personnel were allowed to innovate and try out new products and services.

To enhance continuity from first to final years, oversight over all the years is needed. In medicine, there is a movement away from disciplines to holistic clinical training. As academics only have control over their own subject, it is difficult to influence everyone. In an attempt to address risks, steals a lot of energy to influence those that do not innovate as issues are not extrapolated to the population. The nature of the academic occupation is not to influence, but rather to be dependent on one's own intellect. This is a barrier in UP, which focusses on 1% of students (20/80 principle). Although innovation is essential in HE, one respondent felt that staff was overwhelmed by everyday responsibilities, and that not many venture into new avenues.

The role and attitude of management needs to facilitate the adoption of innovation. Mentorship and encouragement are essential factors, and more support from the heads of department and faculty is needed. Interest and encouragement from the dean and top management will encourage academics to adopt innovation. In this regard, one respondent mentioned that 'the positive attitude of the dean and the support by students and teaching assistants' encouraged her to innovate. More guidance and information on the structures and regulations in the institution should be made available. The support of an excellent team leader to drive the entire process works very well, as well as support from peers and the departmental head.

Innovation is mostly reliant on the individual driving the initiative, and to a lesser extent on processes. In this regard, one respondent said: 'I found it to be not very supportive, and it seems a lonely road.' However, when the department supports such initiatives, there is often room for discussion on these innovations, which may generate additional ideas for others to also implement innovation processes. Currently, innovation is done on an *ad hoc* basis, without any change processes. This is evident in the response: 'Although my head of department allowed me to start the initiative, I did not receive support initially. On the contrary, I had to fight the system and find my own funding. Eventually, as the project became more successful, I had the support of management. Colleagues were never really interested in collaboration, and I think this can be very demotivating for staff. It means extra work, less publication time, and less promotion opportunities. Eventually, I found support through the US embassy. Had it not been for the financial backing of my ex-husbands' mining company, I would never have been able to implement this. I needed

busses for the projects, and could not secure funding. After one year of successful implementation, I received backing from DIA and later from the Department of Community Engagement.’ Working as individuals influences the notion the ‘tipping-point’, which is the point at which enough individuals in a system have adopted an innovation so that the innovation’s further rate of adoption becomes self-sustaining.

If the head of the department believes in and supports you, he or she will manage the conflict, as people can be hostile towards you. One respondent indicated that she and the head of the department had to keep their relationship a secret, so that the head of the department could manage the jealousy of others. The dean gave a respondent the opportunity to implement her programme because there was money available from the DHET for a period of three years. At present, the staff members in the programme still have to ‘convince’ the dean that the programme is actually achieving the desired results, while the lecturers’ understanding is that implementing something new, different, and ingenious, in order to improve on existing ways of doing, is good.

In contrast to the well-defined measures of research outputs, accurate indicators of teaching performance are lacking in the performance management context at UP. The core eight indicators used for unit- and faculty teaching performance are very blunt measuring instruments (i.e. the pass rates in modules or the overall pass rate achieved in a faculty, and the ratio of staff to students). The rewards for performance in teaching are also less concrete than those for research, with a lack of clear milestones towards advancement, and a perception that excellence in this area is superseded by research performance. UP rewards, such as the Innovation Awards, benefit academics as a driver for change, because, where they did not have authority, the award gave them some authority in the eyes of their colleagues. In the academic arena, validation, recognition, and appreciation underpin further performance.

Some respondents are rewarded indirectly by their faculties (the Dean’s Award), and are rewarded by the institution through the Innovation Awards. However, there are only a few winners, and this limitation does not really encourage new staff members to innovate. Academics are also rewarded through the performance management system, but this is perceived as superficial. These recognitions and rewards are only useful when they are

shared with others who are more senior in the institution. Academic achievement leads to recognition, but, as was noted by respondents, it does not really bring promotion or any financial rewards, which does not encourage performance. For one respondent, another benefit was derived from adopting innovation, on top of the awards process: 'My innovation experience has resulted in an article published in the Teaching in HE Journal published by Routledge.'

Business process innovation is left to academics' discretion and not really institutionally enhanced. Although the EI Awards are supposed to have a developmental approach, they do not. For example, it is difficult, and sometimes impossible, to get feedback from the reviewers to use for future improvements. As a result, the EI Awards are perceived to be a competition, rather than a step to improving practice. Continuity is a problem. The faculty sometimes resists this. The feeling often is that we have been more innovative than other faculties, and are bound by directives of the Department of Health, rather than those of the university. It is left to the individual members' discretion to decide to innovate and how to approach it.

Academics have a lot of autonomy in what they do in their courses. Therefore, they have a mandate to change things with the support of the head of the department, and they are always open to new ways of doing things. One faculty held an 'idea competition' to stimulate innovative thinking, but people became disillusioned because most of the award-winning ideas were never implemented.

A specific approach that was followed by an academic was, to firstly, brainstorm the idea/intervention with colleagues and peers and discuss the viability thereof. If buy-in is achieved, the head of the department or the programme co-ordinator assigns a small task team to plan the intervention, which could include further research, discussions with peers and other stakeholders, (such as education experts), and training. The task team is responsible for the implementation of the intervention. The individual member or the task team will then reflect on the strengths and weaknesses of the intervention, and make the necessary adjustments. Another approach in the Marketing Department is the concept of 'customer-centricity for innovation', which works really well. The academics put students at the centre of their teaching initiatives, and, based on their experiences, they adapt,

adjust, and maybe change altogether. In another respondent's department, there is no formal process for innovation, even though their academics support the bi-annual EI Awards entries.

Other approaches followed by academics include:

- Some academics are involved in the integration of a course management system (CMS) such as Blackboard, where not many original concepts are introduced. The students are asked to evaluate the module at the end of each semester, and, based on their feedback and criticism, the curriculum is adjusted. Some colleagues like to innovate as part of an informal team of two by identifying, discussing, and developing innovations. Innovations tend to be spontaneous and informal, and not the result of structured processes;
- Another department is open to aspects of innovation related to teaching, research, and community service. Specifically around teaching and research practices, many workshops, brainstorming sessions, strategic planning sessions, one-on-one discussions, and consultations with education experts, practitioners, and peers have resulted in the identification of opportunities for improvement and revising teaching and research practices. These are innovative ways of doing things within the academic discipline of auditing. The process is similar to the action-research process of planning, implementing, reflecting, and improving;
- An innovative intervention (based on a need) is usually identified by an individual or group of individuals within the department or in consultation with external stakeholders. A plan is prepared by a working group and implemented, whereafter the working group will reflect on the outcomes of the intervention, identify improvements or weaknesses, and make the necessary adjustments before implementing the revised intervention; and
- One respondent argued that as she has academic autonomy, and that she prefers to innovate as a part of his/her professional practice. She has no clue to what enabling factors are created by the dept./school etc.

Processes need to be more visible and better communicated. A suggestion was to follow a faculty-based approach in adopting innovation. Academics are only familiar with their own processes and experiences, and are not aware of any formal processes. The most

prominent suggestion was to ‘never give up, but to stay positive and be patient — the end result is magnificent.’ While the current system is working well, small incremental changes are needed. Innovation does not happen overnight — it is a continuous process of planning, implementation, reflection, and re-planning that could be enhanced by someone acting as a soundboard. UP could host a teaching innovation symposium (perhaps every two years), where academics can be exposed to world-renowned teaching innovators who have managed to successfully implement innovations that are appropriate for realities similar to ours.

Students should be given the opportunity to be innovative in their own learning. Innovation and creativity overlap, and if students do not know how to change or try something different, they will struggle to overcome challenges in the workplace. It is very important for students to experience and recognise the value of innovation. This greatly influences the students’ learning experience, as it enhances student motivation and achievement, whilst creating reinforcement for future career opportunities. It is expected of students to be innovative once they join the workforce; thus, being exposed to innovation is critical. If we want to send students into the job market, they need to be well prepared. Students are changing, and we have to innovate to keep up with their changing needs. It is critical for students to experience innovation within an academic environment. Based on the innovation adoption of academics, the students who have been exposed to such innovative teaching practices claimed enhanced knowledge and skills that are in demand in the labour market. Employers in the workplace also commented on the improved communication competencies of UP students.

Critical thinking, systems thinking, and collaboration can be very important skills in the 21st century. Showing rapid change and preparing them for the idea that the world is constantly changing, the same as what would happen in their careers. If we expect our graduates to be able to respond to future challenges and yet unseen realities, it is essential that they experience innovation and change, and can use their agency to bring about change in an unjust society.

A challenge to innovation adoption identified by the respondents was the red tape that lecturers have to face to implement new ideas. The red tape and lack of support and

enthusiasm demotivates academics to innovate. Sometimes, staff members get so discouraged that they give up, e.g., 'My one colleague, tried to implement a new field of study in literacy. She designed a new programme, went through hours and hours of work and eventually it was not accepted. Such wasted efforts which were not recognised and demotivated people, and not many academics will try something similar again.'

There is too much risk for lecturers to start new ventures so many opt not to do it. It only creates extra work and more responsibilities. It could happen that, after adoption, the innovation disappears, as there are no colleagues interested in taking on the extra workload and responsibilities. Realising that people who can't (for whatever reason) do what you are doing will get in your way; your success reflects poorly on them. If the recognition is shared with them, they may allow it. A possible solution is trying a different way, moving away from extra recognition that will make people hostile towards innovation.

Workload and time were identified as constricting factors. The innovations that one respondent had implemented were all aimed at reducing her/his workload and shifting the responsibility for learning back to the students. Massification of HE has caused academics to rather revert back to their old ways of doing things, as was mentioned by a respondent: 'I work as an individual. I'm very creative, but I'm kept back by too many students.' Other challenges mentioned were that certain disciplines change constantly, and, therefore, the academics need to adapt.

Academics were asked for suggestions on how to improve innovation adoption in the UP context. They offered the following inputs, based on their own experiences:

- collaborate with several role players;
- I would keep my work secret longer, to try to limit interference and hi-jacking more;
- try to get greater continuity in modules;
- be positive about your innovation and believe in 'fortune favours the brave'; and
- the trick is to get the students on the 'bandwagon', so to speak, with you — for then you both begin to care about the same thing, and it matters to both you and your students, and teaching becomes a shared learning experience not to be missed for anything.

The academics also suggested improvements that they thought would improve the adoption of innovation in the institution:

- never give up;
- even while the current system is working well, make small changes [incremental]. Innovation does not happen overnight — it is a continuous process of planning, implementation, reflection, and re-planning;
- stay positive and be patient — the end result is magnificent;
- planning is crucial, and having someone to act as a soundboard;
- it would be notable if UP could host a teaching innovation symposium (perhaps every two years), where we can be exposed to world-renowned teaching innovators who have managed to successfully implement innovations that are appropriate for realities similar to ours; and
- a respondent highlighted that the research she did made her think critically, recognising others' opinions. It changed her way of thinking, and gave her skills for teaching (it opened her up to others' opinions).

7.8 CONCLUSION

In this chapter, factors in UP that affect innovation adoption were explored. These factors were identified by the participating academics,. These factors have either a negative or a positive impact on the potential of an academic to adopt innovation in a world of exponential change.

The purpose of HE should be to deliver students as emergent professionals, who can be productive citizens. HE needs to cultivate a resilient mind-set in its students — an ability to change, adapt, re-conceptualise, and engage. Students need to be empowered for agency by involving their imagination for authentic world results. As the global playing field becomes increasingly level, many business forecasters are predicting that workforce creativity and innovation will be the most important factors in establishing and maintaining a competitive advantage.

The next chapter will answer the research questions posed, using the analysed data.

CHAPTER 8: CONCLUSION AND RECOMMENDATIONS

8.1 INTRODUCTION

Higher Education is the major driver of the information/knowledge system, linking it with economic development. However, higher education is much more than a simple instrument of economic development. Education is important for good citizenship and enriching and diversifying life ...Massive investments in the higher education system have not produced better outcomes in the level of academic performance or graduation rates. While enrolment and attainment gaps have narrowed across different race groups, the quality of education for the vast majority has remained poor at all levels. The higher education therefore tends to be a low-participation, high attrition system. (National Planning Commission 2012)

This qualitative case study explored the factors in HE that influence the adoption of innovation positively or negatively, to inform the re-conceptualisation of the graduate career and future employability, by academics. The research was informed by a contextual perspective, and relied on interpretive, constructivist epistemology to reveal these phenomena.

The endeavour to understand the complex UP system in relation to academics' innovation adoption practices was approached in a systemic way in this thesis. Chapter 8 concludes the study by addressing the following aspects:

- Reflecting on what has been accomplished in the study
- Reviewing the research questions and what results were obtained from the data
- Identifying the relevance of the study and what recommendations can be made from the study.

A synoptic overview of the study is:

- Chapter 1 gives the rationale for the study. The problem statement evolved from a pure economic problem to an integrated problem presented through the triple helix model.
- Chapter 2 gives the process I followed to reach an understanding of the underlying theoretical basis. This chapter dealt with the research methodology.
- Chapters 3 to 5 contains the literature review which deals with the concepts, interfaced with one another, that informs the concept innovation adoption. The literature review

discussed and reported on the body of knowledge pertaining to the constructs under investigation. Fundamental concepts are described, and relations are defined, as the foundation on which the ensuing reasoning is based.

- knowledge constructs;
- creativity, innovation, and change; and
- factors influencing innovation adoption.
- Chapters 6 deals with the environment in which the research has been conducted and explains the HE environment moving down to the SA HE environment and ultimately the UP environment. Concepts analysed, were shown how they manifest in the HE landscape, as the change territory.
- Chapter 7 interpreted and addressed the research questions.
- Chapter 8 concluded the study and presented recommendations.

8.2 PRIMARY OBJECTIVE

The primary objective was to analyse the concept of innovation adoption within the context of UP's offering, and to identify factors impacting the adoption process and the relationships between the identified phenomena, without explaining the reasons behind these relationships. This analysis was done from a triple-helix perspective (discussed on p. 58, p. 427 of thesis). The data were analysed in the context of the subject matter, innovation adoption, as viewed by the academics. Their views and experiences regarding what factors influenced their innovation adoption experiences were captured. The views presented are representative views of the academics within UP. The main categories influencing innovation adoption — positively or negatively — were identified by the research, and are provided in Table 123.

Table 123: Inventory of internal factors affecting innovation adoption by academics.

Internal Factors:		
	Factors	Impact on academics
Difference between strategic and operational level	<ul style="list-style-type: none"> ● UP is a research intensive University ● Funding constraints ● EE staffing requirements ● Increase postgraduate training ● Decisions are money driven 	<ul style="list-style-type: none"> ● There are many trade-offs in achieving many of UP's goals ● Managing diverse mix of research and teaching activities ● Decision-making and funding done by executives

	<ul style="list-style-type: none"> • Misalignment between top management and what actually happens • University works in cycles (accept-reject-re accept- reject) • System allows and rewards undeserving academics • UP commits to innovation in-line with the institutions values 	<ul style="list-style-type: none"> • Funding decisions does not lie with individuals (innovation adoption believed to be philosophy of a person) • Very limited funding • Academics have passion but cannot always utilise it • Individual commits to innovation in-line with personal values
<p>Structure and Systems</p>	<ul style="list-style-type: none"> • Unequal structure of support services in relation to research and teaching (funds and staff) • Silo mentality in structures • Limited infrastructure • Accreditation bodies / professional bodies • No formal innovation processes • Performance Management system is an obstacle, not a help • Finance and procurement systems do not support innovation • Formal structure gives leverage – critical, positions one while and Informal structure leads to a ‘wavelength’ authority 	<ul style="list-style-type: none"> • Faculty-based approach that is followed • Difficult to work outside institutional technology/strategy • Are committee and consensus driven while innovation adoption is individual • Academics perceive themselves as casualties of change rather than change agents • Make guidance and information structures and information more visible
<p>Business processes</p>	<ul style="list-style-type: none"> • Synthesis between research and teaching and learning • Nurture research with national relevance/impact • Teaching and Learning perceived inferior • Deliver inquiring and entrepreneurial minds • Awards process - In contrast to the well-defined measures of research outputs, similarly accurate indicators of teaching performance are lacking in the performance management context at UP. The core 8 indicators used for unit and faculty teaching performance are very blunt measuring instruments (ie the pass rates in modules or the overall pass rate achieved in a faculty, and the staff: student ratio.) The rewards for performance in teaching are also less concrete than those for research, with a lack of clear milestones towards advancement and a perception that excellence in 	<ul style="list-style-type: none"> • Widened participation impacts on workload • Not always appointing most competent candidate • Part-time appointments • Assessment process timely – very time consuming in large classes • Time-tabling – repeat classes because of infrastructure constraints • Large classes have multiple presenters (need buy-in) • Rules are different for different processes • Non alignment between processes • Awards gave academics authority • Validation, recognition and appreciation underpins further performance • Awards only recognises a few • Managing time with all their responsibilities is a challenge

	<p>this area is superseded by research performance.</p> <ul style="list-style-type: none"> • Policy • Community upliftment • Appointments • Assessment process timely • Innovation is incremental • Innovation should follow Faculty-based approach • Teaching, Research, community engagement and awards processes should be managed on all levels • No change processes in UP – done on an ad-hoc basis 	
Organisational Culture	<ul style="list-style-type: none"> • Risk averse – risk is avoided or passed onto others • Nature is enquiry-based • High performing culture grows organically • Checklist culture - checkbox mentality • High-performing business culture is a competitive advantage 	<ul style="list-style-type: none"> • Culture of compliance rather than real change (“business as usual”) • Embracing innovation is incremental and problem-driven – could be risky • Culture changes often • Academics are flexible and autonomous • Disengaged employees
Organisational Climate	<ul style="list-style-type: none"> • Workloads • Tension between research and teaching in relation to time and reward • Society still in flux 	<ul style="list-style-type: none"> • Despondency • Conservative personal view on things is enforced • Creativity is not nurtured • EE appointments • Innovation is done by individuals (tipping point notion) • Need a soundboard to change • Need time, space, support and recognition • Colleagues are jealous when recognised
Leadership	<ul style="list-style-type: none"> • Committee and Consensus driven • Hierarchical structure • Poor communication from executive • Paranoid management culture – criticize small mistakes more than great successes • Employer ranked remuneration, rewards, benefits as the most important drivers (disconnect with academics) 	<ul style="list-style-type: none"> • Does not support change • Relationship with HOD needs to be hidden – creates jealousy • Employees ranked having the skills and resources needed to do job properly
Absorptive capacity	<ul style="list-style-type: none"> • Training opportunities • Conference attendance • Disciplinary training versus teaching and learning training 	<ul style="list-style-type: none"> • Understanding of innovation • Dual profession (teaching and researching) • Never give up or despondent academics ‘just surviving’ • Academic autonomy • Staff overwhelmed by day-to-day

		responsibilities – don't venture into new avenues
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Source: (Adopted from data analysis).

The study was initiated to get a better understanding of why there is a perceived lack of innovation adoption in UP, when there is a prevalent opportunity for change. The study was conducted as a case-study, selecting participants from the official awards process of the university. These participants had received recognition from their peers, for their innovative practises. A total of 13 academics (23%) was willing to participate as units of analysis from the 2008 (14 participants), 2010 (19 participants) and the 2012 (24 participants) awards nominees.

Participants were selected on the grounds of their participation in the awards process and their willingness to participate in this study. A representative range of participants were included in the study ranging across all eight Faculties, except Theology, as well as from the Library Services. The participants were from four campuses namely Hatfield, Groenkloof, Onderstepoort and Prinshof. Chosen participants were involved in classes ranging from first year to honours level with varied class sizes from small (54 students) to large (8000 students). The units of analysis included males and females from different ages and ranging from experienced too inexperienced lecturers. The detail regarding the participants innovations are given in Table 121.

The complexity and multiplicity of Universities as organisations is well documented. Universities render a professional service and the professionals within them vary in their training, interests and methods of working. The difference between groups – faculties, departments and academic programmes are remarkable and each acts according to their own doctrine of local interaction. At UP there are four campuses not in close proximity of each other. Each of these campuses hosts some of the faculties:

- Onderstepoort campus – Veterinary Science Faculty;
- Groenkloof – Education Faculty;
- Prinshof – Health Sciences Faculty; and
- Hatfield – Engineering, LAW, Theology, Natural Sciences, Humanities and Economic and Business Sciences Faculties.

The dispersion of the faculties on the different campuses is important as structures and systems within the university were highlighted as factors that hamper innovation adoption. The university follows a Faculty-based approach, which means that Faculties are given autonomy to run their business, contextualised in specific disciplines. Each Faculty consists of many Departments, each with a Head of Department (HOD). These Departments are all run according to the practises of their discipline and with their own internal processes. Each Department also has a distinctive climate aligned to their discipline which culminates in a Faculty culture. The Faculty-based approach makes it difficult to institutionalise certain systems, such as Faculty award systems, and this leads to some academics perception that it is biased and unfair. On the other hand, it is difficult to work outside other institutional strategies, such as the institutional IT strategy, and this in turn constrains academics in what they want to do. The silo mentality of structures for example finance and procurements, do not support innovation. These constraints makes the constructive alignment of decisions and the operationalization of such decisions very difficult. Within the concept 'academic autonomy' there is no one size fits all.

If the embedded sub-systems of the UP system is considered namely UP, Campus, Faculty, Department and then the academics, one realises how removed the academics are from the UP executive. Academics believed innovation adoption to be the philosophy of a person and that individuals commit to innovation adoption. Decision-making and funding is done by the executives leading to the misalignment between top management and what really happens. The distinct differences between campuses, as well as Faculties, influence business processes and this has an effect on communication and alignment, the two biggest issues. Problematic business processes in the institution has been identified and were listed as:

- Assessment process being very time consuming in large classes and needs to be timed properly so as to mark and submit results;
- Time-tabling – the repeat of classes because of infrastructure and resource constraints;
- Large classes have multiple presenters (need coordination and buy-in by all role-players);
- not always appointing the most competent candidate and reference was made to employment equity (EE) appointments;
- part-time appointments; and

- awards only recognise a few and also allows and reward undeserving academics.

UP is striving to better its international ranking as a research intensive university and therefore there is a lot of pressure on academics to perform discipline specific research. Managing and excelling at a diverse mix of research and teaching activities is difficult and is further exaggerated by the institutions' widened participation, impacting on the academics workload. The dual profession (teaching and researching) of lecturers leaves them overwhelmed by their day-to-day responsibilities and managing their time resulting in them not wanting to venture into new avenues. They have adopted a survival strategy of never giving up or reverted to becoming despondent academics, 'just surviving'. The University is further moving in the direction of a blended teaching and learning model. There are trade-offs in achieving some of UPs' goals and these contradicting strategies have the lecturer at the centre, with limited time, and having to make a choice of what to prioritise. This leads to a perceived organisational culture as one of compliance rather than one geared towards real change ('business as usual') as was identified by the respondents.

Respondents see embracing innovation as incremental and problem-driven. UP is not tolerant of risk in the teaching and learning environment and academics perceive taking risk as 'risky', leading to disengaged employees. Academics were identified as flexible and autonomous by respondents yet their creativity is limited as they cannot experiment in an incremental way, over time. Any change needs to be successful as experimenting with your teaching practice, leading to negative results, is not tolerant and makes academics despondent. Validation, recognition and appreciation underpin further performance and the respondents felt that only a few academics are rewarded. From the respondents view, awards gave academics authority to change and innovate, but colleagues were perceived as jealous when some-one was recognised for their efforts. When one academic had excelled her relationship with her HOD needed to be kept a secret, as it created jealousy.

The organisational climate was experienced as one where a conservative personal view on things is enforced, while creativity is not nurtured. Academics felt they needed time, space, support and recognition as well as a soundboard to change, which was not supported. Leadership needs to support change in order to make it happen. Engendering change is a difficult task because the diverse patterns of behaviour that is displayed in a

complex organisational system such as a University is not determined by individuals but the workings in the institution is run through committees and driven by consensus. Innovation adoption on the other hand is perceived to be an individual activity. Individuals commit to innovation in-line with their personal values. Academics have passion but felt that they cannot always utilise it.

The respondents perceived themselves as casualties of change rather than as change agents. To encourage innovation adoption amongst academics it is necessary to give guidance and information, in a more visible way in order to get a common understanding of innovation. The power of the most influential parties, dominate the change process and this points to those who control the sources of funding and away from those who control the generation of knowledge, the academics.

The research aimed to contribute to the literature on factors affecting innovation adoption in a HE institution by providing an inventory of possible factors. In developing the inventory, the researcher focused on academics innovation adoption behaviour, drawing on a literature review, various documents and interviews.

8.3 SECONDARY OBJECTIVES

The secondary objectives of the study were to:

- understand how academia makes sense of innovation and the adoption thereof;
- construct perspectives about innovation adoption in the institutional functions, as reflected in the institutional strategy;
- explore the relevant organisational characteristics that foster employees' entrepreneurship leading to innovation adoption and how members of the institution respond to these characteristics to maximise innovation adoption;
- explore how the creative process and capabilities vary in the institution (routines and processes);
- interpret the 'When?', 'Why?', and 'How?' of innovation adoption in the functions of the institution;
- identify and interpret the critical enablers of and barriers to innovation adoption;

- determine how the absorptive capacity of the relevant individual affects their innovative performance, e.g.:
 - are certain disciplines more conducive to innovation than others?
 - are some types of work experience more important than others, e.g., work experience achieved in the same sector compared to work experience achieved in other sectors?; and
- explore polarities between the institutional intent to adopt innovation and the economic alignment of the HE sector with SA's human resource needs.

These objectives were addressed, and the results are summarised in Table 124.

Table 124: Secondary objectives to study addressing.

Secondary objective	Participant inputs
Understand how academia makes sense of innovation and the adoption thereof. Academics mostly understand the adoption of innovation in response to a 'problem' or trying to survive in their environment	<ul style="list-style-type: none"> • Innovate by 'accident' not planned. Iterative process (trial and error) • Get students to work with you • Experiential training - 'real life' industry challenges • Using new tools to do something, not necessarily electronic devices • Designing a learning space as a sharing platform with virtual teams • Augmenting modules and skills-based modules- implementing something new, different and ingenious in order to improve on existing ways of doing • Blended education approach - aimed to put a career and research focus on education • Environment that value teamwork - This helps students to become independent learners, co-producing learning with the client and the facilitator while using creative problem-solving. • Process of trial and error - took a new idea and implemented it effectively and successfully after reflecting on what did not work and why • Presentations Workshop - engagement between students, lecturers and internal audit practitioners and promoting active and collaborative learning • Customized game for the students to apply creativity based on research in that specific area. Creating or synthesizing a new solution to a problem • The ability to respond to a situation in a way that brings new understanding (of the problem; of the people; of the practice) • Implementation of the learning area technology in primary schools in Gauteng and Free State provinces. Creative, new fresh look at an approach to transfer knowledge to student • An intervention in an existing tuition structure with the purpose of making study material accessible and relevant • Cross-Cultural Language Enrichment (CCLE) to empower learners to enrich their command of English • Projects based on innovative teaching strategies
Construct perspectives about innovation adoption in the institutional functions as reflected	<ul style="list-style-type: none"> • Innovation is a 'solo' process and is done by individuals. • Colleagues were never really interested in collaboration, and I think this can be very demotivating for staff. • It means extra work, less publication time, and less promotion opportunities • There is no formal innovation strategy in the institution and therefore

<p>in the institutional strategy</p>	<p>academic staff is not measured on their innovation adoption.</p> <ul style="list-style-type: none"> • I found it to be not very supportive and it seems a lonely road • I had to fight the system and find my own funding • What I experienced is trial and error, finding things out the hard way and just going ahead blindly • Side stepped red tape - is a huge risk • Support and recognition superficially • Individual members' use their own discretion to decide to innovate and how to approach it and it is not really enhanced. • HOD usually supports. • Department/Faculty encourages innovation but do not necessary have a specific approach. • Some tension exists between the expectations of the institution as reflected in the UP strategy and the operational realities that face academics in the class. Academics also perceive that there is no support or recognition for them. The risk of innovating and trying out new things is not tolerated. • Staff are overwhelmed by every day responsibilities and not many venture into new avenues • Approach in one Department: <ul style="list-style-type: none"> ○ firstly brainstorm the idea/intervention with colleagues and peers and discuss the viability thereof. ○ If buy-in is achieved, the HOD or programme coordinator will assign a small task team to plan the intervention (which could include further research, discussions with peers and other stakeholders (such as education experts) and training). ○ The task team is responsible for the implementation of the intervention. The individual member or the task team will then reflect on the strengths and weaknesses of the intervention and make the necessary adjustments accordingly. • My own approach is one of visualizing what I would like to see in my practice and then to use action research to achieve this • We are dependent on the guidelines, policies of the Department of Health and the professional body (HPCSA)
<p>Explore the relevant organisational characteristics that foster employees' entrepreneurship leading to innovation adoption and how members of the institution respond to these characteristics to maximise innovation adoption</p>	<p>Such characteristics are:</p> <ul style="list-style-type: none"> • Professional bodies that ask academics and their programmes to comply or otherwise loose accreditation • Advisory boards (future employers) that guide and lead academics to innovate to make their student marketable • Educational studies that enlighten academics on new ways of doing things such as the PGCHE programme • Changes in structure in Department or in responsibilities • Students admitted in the institution and addressing their needs • Small sphere of influence as a result of the occupational characteristic "academic freedom" and the consensus nature of work in institution • To address risks as well as managing those that do not innovate - steals a lot of energy • Issues are not extrapolated to the population • improve on the current model by streamlining some of the outcomes, evaluation and specification of the challenges • Being able to change the structure of how things are done in institution • Networking with possible partners; • Competent, committed and experienced course facilitator and programme coordinators • Tutor system to support academic programme • Taking holistic approach (big picture) • Game-based learning • Experiential training

	<ul style="list-style-type: none"> • Service-learning model • Student feedback forms • Allow specialization / Time, space, support and recognition and appreciation. • Performance Management system
<p>Explore how the creative process / capabilities vary in the institution (routines and processes)</p>	<ul style="list-style-type: none"> • My Department/Faculty encourages innovation but does not necessary have a specific approach. Academics mostly decide on the how, what and when. • Know only about own processes, experiences. Not aware of any • In marketing we have this concept call customer centric and I think for innovation this works really well. Involve students and other stakeholders • Innovation is mostly reliant on the individual driving the initiative. However, when the department supports such initiatives then there is often room for discussion on these innovations which might spark some additional ideas for others to also implement innovation processes. • There is no formal process for innovation within the department however it supports the bi-annual education innovation awards entries. • In our Department there was probably a serious lack in innovation, and to some extent still is • I find certain structures in the University do not support innovation: one of them is definitely finances and procurement. These processes have become so full of 'red tape' in the last few years that it stifles innovation • Everyone is left to their own devices to innovate • I don't have enough experience in the workings of the faculty as a whole to answer this question; • We do not have a change process – innovation is handled at an ad hoc basis • Knowledge sharing and team-work is also important • A realisation that 'we have to make things happen ourselves' is also important; • Innovation is more driven by an individual and to a lesser extend processes; We do not have a change process – innovation is handled at an ad hoc basis -driven by the individual that want to innovate and supported by management. • Marketing of e-resources and the use and application of new products • My own innovations have largely happened in isolation without the knowledge and involvement of my colleagues. • We have had a formal 'idea generation' competition in the Faculty before, but people became disillusioned because many of the 'award winning ideas' were never implemented. • A conservative (in some regards) personal view on things are enforced
<p>Interpret the when, why and how of innovation adoption in the functions of the institution</p>	<ul style="list-style-type: none"> • To some extent it is a responsibility of an applied academic to try and help students to make a smooth transition into the work place. • By knowing what some of the skills required by industry is • Research, industry input and international trends motivated this innovation and incorporation into our new curriculum design. • My desire to make a difference when I was given a responsible position. I didn't want to be just another course coordinator • criticism about our Faculty's poor ability to stimulate the interest of our students in rural practice. • Multinational virtual teams typically have to rely on computer-mediated rather than traditional face-to-face communication, facing challenges in areas such as effective communication, information sharing, cultural differences, and time differences as well as overcoming technology issues. • Poor results • After receiving a Foundation grant • Students struggling to find a job after obtaining their degree; The necessity behind the educational innovation was to accommodate the widened

	<p>participation agenda, as well as create a sense of career direction or career path for those countless ambiguous students</p> <ul style="list-style-type: none"> • This specific innovation was also in a reaction to try to ‘simulate’ the workplace to ensure that our programmes are relevant to industry. • The enthusiasm of the students, the need in the community. I was on a committee at the Vroue Federasie (Bostwadi) and met a lecturer in Social Work. We discussed the possibility of collaborating and that was how the initiative started. She had already been working on a tutoring project in Mamelodi to teach Social Work students how to start such projects, but needed tutors. • I enjoy developing solutions to practical problems or inefficiencies experienced in my day-to-day work. My ‘innovations’ are basically the result of trying to do things ‘simpler, better and faster’ • our exposure to other international and national teaching practices / the continuous support from the IAEP Advisory Board in the form of time and advice from practitioners on course content and teaching methods / our exposure to seminars presented by the Department for Education Innovation at UP / our teaching philosophy which focuses on competency development and ‘learning by doing’ • I want to customize library orientation for the NET generation. My research proves that majority of first year students are experienced game players and only a small percentage were non experienced game players • I want to be the best I can be at what I do, and assist the students as well as I can – if I did not, what was the point of this career. Most of what I do seems obvious to me and the challenge is to fight the status quo as well as the ‘check-box’ mentality and get people to recognize the importance of the question: ‘What are we trying to achieve here?’. Unfortunately, the answer often seems to be to do as little as possible, not rock the boat, and do what ‘has worked for hundreds of years’, or otherwise say – they say we should innovate so do something new. It seemed intuitively obvious. I guess I often also ask myself ‘what subject do I wish I had as a student?’ and then I try to create that subject. • Personal dissatisfaction with the content and structure as well as the fact that the teaching was all classroom-based (therefore not contextualized for learning about health systems) and poorly attended. Secondly the module was not meeting the learning needs of the target audience - highly intelligent senior medical students who are critical and whose opinions are valued. ; Exposure to academic service-learning while doing the PGCHE. • Recognition for effort • My realization that our society is in flux still grappling with tragic racist history. My experience in Germany provided ideological roots. I tried to in sue my students with self-assertion: • The decision of RSA Government to cancel Latin as pre-requisite for Law and The Department of Education in South Africa who stopped Latin in Secondary Schools for financial reasons.; Because of the poor English proficiency on elementary, secondary and tertiary level, • Oversight over years. Control over own subject. Do not have authority • If not promoted, it’s OK. Culture of UP - people don’t want to build a career, come from career in industry. Compare corporate. No guidelines, not enforced, communicated. UP pays less, came as favor, spend time on making money. Money not an incentive. How higher the post level outside UP, the more difficult. Stay at UP because of a more balanced life. Non-performance is not regulated in UP (no consequences)
<p>Identify and interpret the critical enablers and barriers to innovation adoption</p>	<p><u>Barriers to innovation adoption:</u></p> <ul style="list-style-type: none"> • Unrealistic expectations top-down approach • the challenge is to fight the status quo as well as the ‘check-box’ mentality and get people to recognize the importance of the question: ‘What are we trying to achieve here?’.

	<ul style="list-style-type: none"> • More support from the Head of Department and Faculty. Mentorship and encouragement are essential factors. More guidance and info on the structures and regulations • In order to truly be innovative in education, it is at times necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. • Workload • I don't feel universities value innovation enough. There is more emphasis on research and post-graduate studies than innovation on under-graduate level. To me the two areas are inter-changeable • I was initially allowed to implement ideas I had (even though I had to take the criticism and 'flak' if something didn't work perfectly, but had to share all the credit if things did work). <p><u>Enablers to innovation adoption:</u></p> <ul style="list-style-type: none"> • Time-table • Our students have limited exposure to 'real' life marketing challenges and we wanted to create a simulation of reality and that ignited a new teaching model • I was appointed as the course coordinator • Extended pgm (ENGAGE) • External stakeholders / Alumni / Advisory board • Experience • Curriculum review • Conferences / training courses • In order to truly be innovative in education, it is at times necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. • I felt the course was not effective, classes very big and the skills not addressed • Workload • Technology – e.g. game based learning • The chalk and talk way of teaching struck me as inefficient, often ineffective, boring, frustrating and frankly useless, especially in a world where students are learning at an incredible speed, given more stimulating, relevant and connecting learning / teaching methods. • service-learning teaching and learning strategy • Experiences – Teaching 10 years at Vista University gave me insight in the community and student population • Due to a curriculum update and the renewed focus on aligning our curriculum with industry demands • Inefficient literacy courses • Experiences • Grounding - passion for education - leads to trying to create the best experience. Students are clients.
<p>How does absorptive capacity of the relevant individual affect the outcomes in terms of innovative performance:</p> <ul style="list-style-type: none"> • For instance, are certain disciplines more conducive to innovation than others? • Are some types of 	<ul style="list-style-type: none"> • 4 years of experience as lecturer, no formal training in higher education • Radio, film, television and stage acting and radio and television presenting. • .We obtained full support from our department to experiment with this teaching model and allowed a lot of freedom in terms of what we wanted to include in our courses. No training but it should also translate in some research output, well at least in my mind that is the only additional way one could create an output in terms of the current focus of research at our university • I received no training directly linked to this project. I did however attend a short course in ClickUP and I did a diploma in tertiary education; PHD in Higher Education, Academic development and support – Factors influencing academic achievement with university students; I am trained as an

<p>work experience more important than others e.g. work experience achieved in the same sector compared to work experience achieved in other sectors?</p>	<p>Educational psychologist and have worked as a student counsellor for 13 years before joining UP in 2005.</p> <ul style="list-style-type: none"> • As an increased student capacity calls for innovative educational approaches to be implemented in order to meet the increased demand and diversity • PhD (Marketing); Support from department to experiment but no training. • I seek the guidance of the Department of Community Engagement • MCom Marketing Management; I have received no formal training to support these innovations. Where necessary, I have trained myself. • Receive an amount of R30 000 as seed funds from the Dept. of Education Innovation • BCom (Honours) Accounting; MPhil (Workplace Ethics); Certified Internal Auditor (CIA) accredited by the professional Institute of Internal Auditors (IIA). • International peer: Visit to Dr Glenn Sumners.at Lousiana State University, USA to examine his teaching practices in internal auditing; • Training and background in Information Literacy training and informal training in Scotland; Supporting students and lecturers with information literacy training and general support. • No formal training; mostly my own thoughts, projections and I read a book many years ago called 'The Learning Revolution'. I also, in 2003, did a De Bono Creativity course at the University as part of a test group. • Comfortable with not having to move out of their comfort zones (part of me still believes this). • Support for innovation – I was initially allowed to implement ideas I had • Contract worker and since achieved success in innovation was left out of normal structural routes to do my own thing. • Diploma Higher Education (US), Research Nation at Risk; University of Virginia (UVA). As Director of Academia Latina, Department of Ancient Languages, I experiment with different programmes to illustrate and prove the motto of the centre: "Vivit Lingua Latina" • Mcom Tax Education. Wanted to get involved in teaching from young age it. No educational training. Stopped PGCHE. Want to do PHD in tax education. Space to excel - education was interest from young age. Learn from experts - brown bag lunches, stimulates creative thinking. Univ priority courses gives enough opportunity; likes to learn - platform to learn in your own hands. Need to have a plan and make time for important things - will make it a priority.
<p>Explore polarities between the institutional intent to adopt innovation and the economic alignment of the higher education sector with SA's human resource needs.</p>	<ul style="list-style-type: none"> • Allowed – no support • Fight the system • Find own funding • No in collaboration • Very demotivating for staff. It means extra work, less publication time, and less promotion opportunities.

Source: (Adopted from analysed data).

These objectives echo the sentiments of Drucker (1999), who differentiated between the 'How to' and the 'Why?' of getting organisations to do the right things, rather than doing things right. The rationale for completing this research was to contribute to a better insight

into the changing paradigm of tertiary education globally and in SA, in order to better embed innovation adoption in UP. Innovation is a continuous and never-ending process (Ailin & Lingren 2008, p. 87) that holds the key to working systematically with a long-term perspective on societal needs and emerging research in science and technology, as well as systematically approaching the wider inclusion of stakeholders in strategy- and priority-setting processes (Rasmussen *et al.* 2010, p. 37).

UP changing to a research intensive University to compete globally, constrains academics in the institution by when and how they innovate. The curve balls presented by Government to the institution (massification, constraints on funding, EE strategies, poor schooling, IT infrastructure) impacts on the innovation adoption of academics. The burden on academics to do research and publish, while also innovating in teaching and learning and creating resource-rich environments, impacts on their professional development. Private sector investment-led and state-led growth paths differ putting pressure on graduate attributes and job-creation.

The institutional business structures and processes give unequal recognition to research and teaching and learning, and necessitates that academics make trade-offs in achieving many of UP's goals. Risk aversion, inconsistent rules, timeous decision-making processes, and poor communication inhibits the creativity and innovation adoption of academics. Decisions are consensus and committee driven while in UP individuals commit to innovation adoption in-line with their personal values. UP follows a faculty-based approach and it is difficult to work outside the institutional technology structure.

At UP academics are appointed on the bases of their discipline knowledge with either a masters or a PHD qualification and in some cases, a professional qualifications. Academics with only a masters degree are encouraged to complete their PHD as soon as possible and are copiously assisted with funding and time. Academics are required to do a certain amount of research in their discipline each year. This is managed by their HODs' through the performance management system. In HE there is an established peer evaluation process for publications and academics receive incentives for their publications in accredited journals. As research and publications are directly linked to the UP strategic plan, the institutions world ranking as well as academics' promotion, it is prioritised.

When appointed academics need to attend priority courses during their probation period of 2 years. The focus of these courses are on teaching and learning, aimed at improving the teaching skills of academics, given all the challenges they face in the lecture hall. Teaching and learning is not part of academics performance management and does not receive the same priority as research. Academics therefore do not move beyond the teaching skills to pedagogical competence (Figure 81 pg 433). Pedagogical competence is where academics start reflecting on their practice which could lead to innovation. However research in teaching and learning is not encouraged. Academics are overwhelmed by day-to-day responsibilities and don't venture into new avenues. They struggle with time-tabling issues, resource constraints, large classes, and leaders who are perceived not to support change and fall into a culture of compliance.

Academics perceive themselves as casualties of change rather than change agents. They don't perceive to have leadership support for their dual profession of teaching and researching or for change. The hierarchical structure and non-alignment of processes makes it difficult if not impossible for academics to adopt innovation. Academics see themselves as flexible and autonomous and need time, space, support and recognition to innovate but feel that creativity is not nurtured while risk is avoided, in the institution. Validation, recognition and appreciation underpins performance and attention is needed to award more academics for teaching and learning as it gives academics authority to do more.

These factors are drawn together in Figure 81 to give a systemic view of how interlinked and dependant all these factors are, in creating a system that promotes innovation.

This study has several limitations that suggest opportunities for future research. Data were collected in a South African, research-intensive institution located in a developing economy. Results may differ for other types of institutions in South Africa, as well as for institutions in developed economies. Results may also differ in other cultural contexts or better-resourced settings. Moreover, the fact that we collected data from only one institution might have reduced variations in identified factors.

8.4 RECCOMENDATIONS

The SA Minister of HE and Training, Blade Nzimande, has stated that the pace of transformation in universities in SA is too slow and he specifically mentioned UP (p. 312).

The risk to SA is a diminishing pool of the talent that is required for a competitive advantage. As a consequence of the economic crisis, it was pivotal for SA to maintain and increase employment opportunities. An essential part of all sector revival agendas is focused on developing skills and promoting high-level competencies. A permutation of actions on public employment, private sector initiatives, and training could be complementary to counter-cyclical measures to escape a recession and possible job losses.

In the literature (p. 278) the groupings to measure HE performance placed SA on an overall rating of 44. The different rankings out of a score of 100 were resources (35), environment (69), connectivity (62) and output (19). This shows the need to improve on student graduation (output) as well as address the significant mismatch between the output of the sector and the needs of the economy (p. 301)

Table 125: Recommendations mapped against literature and findings.

Issues raised in Literature	Issues identified through study	Recommendations
<p>Change strategies need to speak to the essential function of the institution - quality HE system is well connected internationally and enables the induction of novel ideas (p. 276)</p> <p>Transformational educational growth and/or change through innovation should be viewed as a strategy - realisation accomplished by developing transformational leaders who can cultivate a talent-driven and improvement-driven culture for the future (p. 282)</p> <p>The adoption of transformation requires clear organisational plans, strong leadership, and sustained commitment, framed by critical self-reflection for change, associated with learning technologies.</p> <p>In a social context, teaching and learning environments are dynamic, and demand a collective vision and vigour that touches the whole organisation. The underlying forces of change are contingent on the degree to which the organisation's strategy, structure, and culture blend in unity.</p>	<ul style="list-style-type: none"> • Misalignment between Top management and what actually happens • There are many trade-offs in achieving many of UP's goals • Silo mentality in structures • No formal innovation processes • Performance Management system is an obstacle, not a help • Finance and procurement systems do not support innovation • Risk averse – risk is avoided or passed onto others • Checklist culture - checkbox mentality • Tension between research and teaching in relation to time and reward • Society still in flux – diversity issues 	<p>UP needs to develop an innovation strategy and roll it out. The process should be inclusive and should be institution-wide with contextualisation within Faculties, taking note of the triple helix model. The strategy should be sufficiently resourced and supported. Together with the strategy a common understanding of what innovation is and how it will be supported and recognised, needs to be developed. UP needs to create a culture that tolerates risk and experimentation in pursuit of excellence as lecturers need a 'safe' environment to try new things, while accountability for innovation must emphasize progress and learning.</p>
<p>HE has to adopt an innovation-friendly organisational design, and incorporate it into the core curricula (p. 277)</p>	<ul style="list-style-type: none"> • Hierarchical structure • Nature is enquiry-based 	<p>Structure follows strategy and if an enquiry-based, risk tolerant strategy for innovation can be negotiated and implemented, a more meaningful and aligned structure can be determined. This structure needs to align business processes such as performance appraisal, recognition, funding, training complemented by transformational leadership.</p>
<p>Leadership that:</p> <ul style="list-style-type: none"> • encourages innovation; • entrepreneurialism in core departments • is visionary, process-based leadership style that realises potential (p. 284) <p>Leaders need to step away from reductionist viewpoints that stand in the way of holistic systems thinking, and move beyond functional skill sets (engineering, finance) (p. 299)</p>	<ul style="list-style-type: none"> • Committee and Consensus driven • Poor communication from executive • Paranoid management culture – criticize small mistakes more than great successes • Disconnect with academics • Does not support change 	<p>UP needs to improve on the communication between the executive and the people on the ground. Distortion of messages is a result of the strict hierarchical structure and interpretations associated with messages. Leadership of the institution is perceived to be 'disconnected from academics' and this results in 'business as usual'</p>

<p>Government funding of universities should be within institutional arrangements that ensured that it did not exert undue influence on what they did (p. 286) The HE budgets should allow for the massification (increased access) in HE enrolments, this is currently not the case, and institutions are struggling to meet their operational budgets. (p.305)</p> <p>Student debt is exceptionally high, and puts a lot of strain on HE institutions by restricting their operational budget. (p. 309)</p>	<ul style="list-style-type: none"> • Funding decisions does not lie with individuals (innovation adoption believed to be philosophy of a person) • Very limited funding • Widened participation impacts on workload • Assessment process timely – very time consuming in large classes • Time-tabling – repeat classes because of infrastructure constraints • Large classes have multiple presenters (need buy-in) • Managing time with all their responsibilities is a challenge 	<p>Budgets within UP does not allow for the increase in student numbers. This is exasperated by the language policy of UP that allows students to study in Afrikaans and English. This impact negatively on the workload of lecturers leaving little time for innovation.</p> <p>Funding also impacts on class attendance of students as there are issues with late registration and registration changes. Funding impacts on numerous administration processes, resources, morale of academics and the ratio of academic versus students UP needs to address either the massification or the funding models.</p>
<p>HE has a significant need for business-model innovation - concentrate on creating a manageable and practical environment, where sound innovation theory can safely be applied (p. 289).</p>	<ul style="list-style-type: none"> • Nurture research with national relevance/impact • Teaching and Learning perceived inferior • Teaching, Research, community engagement and awards processes should be managed on all levels • No change processes in UP – done on an ad-hoc basis • Rules are different for different processes • Non alignment between processes • Academics have passion but cannot always utilise it 	<p>Alignment is needed between how the needs and strategies of UP could be balanced with those of the individual (research, grants, and personal brand).</p>
<p>The inter-generational divide (seeing things through a different prism than that of students) and asymmetry of resources, especially digital resources, create challenges that can only be addressed in innovative ways. (p. 311)</p>	<ul style="list-style-type: none"> • Academics perceive themselves as casualties of change rather than change agents • Culture of compliance rather than real change (“business as usual”) • Embracing innovation is incremental and problem-driven – could be risky • Creativity is not nurtured • Does not support change • Staff overwhelmed by day-to-day responsibilities – don’t venture into new avenues 	<p>Disengaged and overwhelmed employees are not creative and will not support change.</p>

Source: (Own compilation).

The most distinct recommendation from the study is that the University of Pretoria needs to develop a constructively aligned innovation strategy and roll it out, focused on developing skills and promoting high-level competencies in graduates, based on the flows and impacts described in the triple helix model. These innovations need to speak to improving student graduation (output), curriculum responsiveness as well as address the significant mismatch between the output of the sector and the needs of the economy (p. 301). Furthermore this strategy needs to engage employees to contribute creatively and be aligned with available resources.

Future studies may expand and clarify the present findings, which suggest interactions among the different factors that were identified. Further theoretical and empirical efforts could enrich our understanding of innovation adoption by academics, by offering micro-process-based accounts of these factors that complement the existing literature.

In a complex, interrelated environment in the context of a rapidly changing economy and employment market, the commitment to adopt innovation may require specific, tangible resources that universities may not be able to supply, such as substantial funding. Leaders need to understand that there are fundamental challenges in achieving innovation adoption, and that there are factors outside of the academics sphere that impact the change process in HE. These include leadership, constructive alignment between stakeholder's expectations and behaviours, business processes and available resources.

There is a sound rationale for connecting HE to enterprise and ultimately employability, but there can be fundamental challenges in achieving this desirable and necessary shift, such as academic management, culture, employers' perceptions and experiences of HEIs, as well as student expectations and behaviours. Some effective and innovative practices are being deployed by universities in novel ways to overcome these challenges. These practices, through and beyond the curriculum progress, suggest that by connecting together interactions between university students, staff, and employers these challenges can be overcome. This can be conceptualised on two levels: through institutional connectivity and through integration of the individual learning experience, demonstrating innovative and enterprising learning-centred approaches that are in accord with

government policy on HE. It is difficult to rely on a single strategy for the enhancement of employability skills; a mix of learning and development approaches would be beneficial.

APPENDIX A: Inventory of factors affecting innovation adoption.

1 st level codes	Thematic Subthemes
<p>Never give up. Innovation must be properly linked Reading articles, attending international short courses, work in international academic institutions is a great catalyst. Collaboration with industry partners worked very well. To work with like-minded academics Build on previous innovation). Innovation can at best be stimulated and nurtured, not planned, structured or forced. Some people are natural innovators: sometimes successful and other times not. Innovated by "accident" Innovation in an academic environment is often driven by the individual Innovation is the constant enquiry into the relevance of what I am teaching and how effective it is (from a teaching point of view). Using new tools to do something Some people see electronic devices as synonymous with "innovation".</p>	<p>The Innovation success / Innovation orientation of lecturers (How do they feel about innovation)</p>
<p>I need to have a burning desire to 'enthuse' (create enthusiasm among) the students and a consuming dissatisfaction with a deep desire to change that which does not work in the course I am responsible for. You must be open and flexible and learn from mistakes. Iterative process Creative environments, challenges, support, training and positive attitude. Interest and encouragement from dean/top management Attitude. Enthusiasm and passion Assessed on this e.g. in Performance Management. Support is essential. If this is not encouraged, it will not happen Innovation starts with an individual who recognizes an opportunity, problem or inefficiency that requires change (i.e., innovation) and who is motivated to act to change the status quo - it starts with an innovative mind-set. Creative mind-set / Openness to change / Philosophy of continuous improvement and competency development. Passion; sense of agency, personal values Validation, recognition, appreciation. Mobility in thinking, Adapting to society's changing needs. A knowledge and passion for ones innovation project. The organisational climate, Attitude of management, Personal motivation. Willingness to experiment and learn. A bond of mutual trust. Frequent consultations with mainstream lecturers. What I experienced is trial and error, finding things out the hard way and just going ahead blindly Innovations that are self-initiated work best because then the people involved have taken ownership and want change to happen. Innovative ways of thinking is critical to being a successful academic. Without innovations academic cannot address the changing needs and expectations of stakeholders I think the most important thing is to use the most appropriate teaching methods / aids / techniques, rather than just using something different so that you can say you 'innovated'. To fight the status quo and the 'check-box' mentality and get people to recognize the importance of the question: "What are we trying to achieve here?" People don't want to do new things when they should, and want to do new things when they should not.</p>	<p>Factors leading to innovation</p>
<p>Watching and observing students and the new trends as they present themselves Thinking of ways in which they can be employed or harnessed. I will always try something new / different every year I will always explore new ways. Constantly changing or adapting class notes, study guides and presentation of lecturers to new ways or current trends. Program implemented - assessed student progress. Study new information / approaches on education innovation. Reading an article / having an interesting conversation with colleagues could spark an idea now and then but I think it is more up to you to try to be innovative. Applying everyday things into an academic environment Reflection and discussions by students are essential. Attending conferences and reading up on new ideas. Also attending courses and workshops, discussions with experts. Reflection on my own teaching and research practices and regular discussions with peers and other stakeholders such as practitioners, alumni and researchers, fosters innovation. Seize the Day / Opportunity. External factors – cancelled Latin in schools My realisation that our society is in flux still grappling with tragic racist history</p>	<p>How do lecturers foster innovation</p>
<p>Generate the desire among the students. Challenges both client and in-class based activities.</p>	<p>Tools used to Innovate</p>

<p>Group work Competition work Practical (hands-on) project Holistic approach (whole process experienced practically, so that the students could see the bigger picture) Soft skills development. Experiential and collaborative learning. Virtual teamwork in a computer-mediated environment. Making use of additional modules instead of just regular tutor groups Use lecturers who are not only knowledgeable in their academic fields but who are also passionate about teaching and the development of student potential. Competent, committed and experienced course facilitator and programme coordinator Inputs from practitioners and academia. Structured planning and implementation process / Experiential learning tool – “learning by doing” workshop; Funding to use external service providers when internal service providers cannot provide the service TEARS principle. Game based learning A service-learning strategy Reflections, pink forms (feedback, photos / don’t expect every-one to be experts in every field) Allow specialisation / Time / Space / Support / Recognition and appreciation. Performance Management system. Making work relevant.</p>	
<p>Involvement and willingness to collaborate Ability to change Follow your heart Perseverance A genuine aspiration on the part of the lecturer I am always intrigued by new workshops and support offered by UP If people cannot see innovation happen in a realistic period of time, they become despondent</p>	<p>Personal characteristics of academics that innovate</p>
<p>Go to conference. Use of action research. Think to a large extent it is a personality trait more so than a skill, Some academics do not know that they are innovative because it is not their field of expertise. In their field academics read something or experience something and then decide to try it in class. Training on technical terms is necessary for innovation. Attending international courses. Used Rogers’ innovation model Read some articles on innovation Innovation is a state of mind that is often supported with technology. Thus new technology and the use thereof could help. Help needed with practical implementation Training could assist academics to think differently and reflect on their teaching and research practices. Training can expose academics to different ways of doing things - academics not open to change will not be interested in innovation. AT UP no workshops / presentations / courses about innovation were presented. Could introduce something like that. Freedom to develop modules. Not restricted in content. Not prescriptive; Attend conferences KPI of percentage of students that must pass. Loosely based on the concept of the television show, The Apprentice. Experience was a much better way to learn, than by trying to study the information from a book. Exposure to academic service-learning while doing the PGCHE. Self-motivator who likes to do things differently Innovation was reaction to ‘simulate’ the workplace to ensure that programs are relevant to industry Add value to students and better equip them through real life challenges / problems to ensure that they are more employable students Opportunities to practice the skills discussed in the lecture hall, in real life; to make the teaching learning experience more relevant and authentic.</p>	<p>Absorptive capacity. How do academics learn about innovation</p>
<p>Technology allows for resource leveraging and knowledge sharing. Innovation resulted in an article</p>	<p>Benefits /rewards of innovating</p>
<p>It emboldens you to think in a challenging way about the other subjects you teach as well. I am a firm believer in changing as the environment changes and due to Marketing being a discipline where many aspects are driven by market changes it is essential to try new things in your course regularly. It creates a challenge for an academic to think differently about their discipline. The value of innovation for the students can only be measured when they are in the job market Some of the skills and knowledge obtained is now evident and useful for them in their daily activities. HE institutions’ focus should not just be on the knowledge they transfer or install in students but more on getting students ready to work in any industry. There should be a more holistic approach in terms of life skills, transferable skills, entrepreneurial outlook, handling and overcoming challenges.</p>	<p>Value of innovation</p>

<p>Enhanced knowledge transfer – as the purpose of the additional modules is to develop and enhance basic conceptual understanding and how to apply this knowledge in the mainstream modules – to also improve their academic achievement in the mainstream modules. To convey 'flexible learning' which delivers learning options that is better aligned with the learning needs of students. The blended educational approach allows for widened participation of students, making way for local, national and international involvement. Benefit of blended educational approach is the integration of teaching and learning approaches, (face-to-face and online) Flexible learning delivers learning options that are better aligned with the learning needs of students. Blended educational approach allows for widened participation of students, making way for local, national and international involvement. Staying relevant, equipping student for job market. Innovative thinking and being exposed to innovative new ideas are essential - it serves as the "seeds" for one's own innovations. Students will only function effectively in the world of work contribute to resolving the many challenges of our society if they are taught and encouraged to innovate. Academics will not be able to address the changing needs and expectations of various stakeholders—students, employers, practitioners, government etc if they don't innovate Value of innovation adoption to students is extremely significant. Many students return to HE environment to further their postgraduate studies. The importance of innovation is underlined in the Vision and Mission of some Departments The primary role as an academic is to create rich environments in which students can learn. The value of innovation is the progression towards more satisfying and meaningful academic practice. Role model and appropriate graduate attributes. Important for community we serve. Value lies in bridging gap between senior certificate training and higher education. Learning orientation transfer most significant. Innovation is a good experience - made academic feel that they made a difference; when breaking loose from a traditional method of doing something, and start a new way of reaching the same or a higher goal.</p>	
<p>Red tape that lecturers have to face to bring in new ideas / lack of support and enthusiasm is too demotivating to innovate. Staff gets discouraged and just give up Too much risk for lecturers to start new ventures so many opt not to do it. Does not really bring promotion or any financial rewards, why would staff do it? It only creates extra work and more responsibilities. Innovation might disappear, as there are no colleagues interested in taking on the extra workload and responsibilities. Realize people who can't (for whatever reason) do what you are doing will get in your way; your success makes them look bad or feel bad. If the recognition is shared with them, they may allow it. You to be open for change all the time. In some Faculties there is little if any structured attempts at teaching students how to be innovators. Workload and time are constricting factors. Some individuals (e.g. order books) / Work as individual, very creative but kept back by too many students, Change constant (OBE / capstone). Large classes fall back on old ways (games), Not own classroom. Perception of experience versus knowledge. Not CA qualification, difficult to measure - avoided. Must first pilot to ensure it works. Try a different way – move away from extra recognition, people hostile towards innovation, intrinsic motivation Modern day students: 7:30 poor class attendance, lack of interest, students found it strange, hard to understand, boring – needed to change Our students have limited exposure to 'real' life marketing challenges and we wanted to create a simulation of reality that ignited a new teaching model. We therefore incorporated client-based as well as in-class challenges for students to interact with the knowledge they have about the subject but in the same sense develop managerial skills necessary in industry. I was appointed as the course co-ordinator and wanted to make a very significant contribution that could change the way that we teach certain aspects Criticism was often heard from the rural veterinarians that the Faculty was not stimulating the interest of students in rural practice. The industry has changed dramatically the last 10 years. The industry is fast paced, changes constantly and is also dispersed. Globalisation and the nature of retailing (supply chain) forces companies to operate in different countries simultaneously. This necessitates interface and collaboration over organisational and geographical boundaries between workers. Also retailers are looking for students that are skilled, have product knowledge and can handle the pace and work under pressure; opportunities and ways to create /incorporate the nature of the clothing and textile industry with the courses I teach and enhance students' learning Professional, personal development of students. The 5 five-year programme offered by UP did not provide significant results in terms of student success and throughput as well as retention. Money became available in a grant, to explore and implement a new Augmented model – the Engage programme.</p>	<p>Challenges to innovation adoption</p>

<p>To be truly innovative in education, it is necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. The TEARS principal satisfied the requirements for education innovation in the way of education, careers, research and community services.</p> <p>Need to better equip students to join the workforce; emulate the workplace.</p> <p>The course was not effective, classes very big and the skills not addressed. Innovations implemented are aimed at reducing my workload and shifting the responsibility for learning back to the students.</p> <p>The need expressed by the Internal Audit Educational Partnership (IAEP) Advisory Board to produce internal audit graduates who have excellent communication skills contributed significantly to the decision to innovate.</p> <p>Game based learning – to keep up with new developments in Education.</p> <p>The chalk and talk way of teaching struck me as inefficient, ineffective, boring, frustrating and useless, especially in a world where students are learning at an incredible speed, given more stimulating, relevant and connecting learning / teaching methods.</p> <p>Dissatisfied with the structure and content of our contribution. After PGCHE, tried to use a service-learning teaching and learning strategy to bring about the change</p> <p>Realised classical philology not contextualised in SA ; Saw dire need of offering student support to indigenous students;</p> <p>RSA Government cancel Latin as pre-requisite for Law</p> <p>Grounding - passion for education - leads to trying to create the best experience. Students are clients. Want to be the best, want to win, give my best.</p>	
<p>Collaborate with several role players</p> <p>Keep work secret longer, to try to limit interference and hi-jacking more.</p> <p>Try to get greater continuity in modules.</p> <p>Be positive about innovation and believe</p> <p>The trick is to get students on the 'bandwagon' so to speak, with you – for then you both begin to care about the same thing and it matters to both you and your students and teaching becomes a shared learning experience not to be missed for anything.</p>	<p>What needs to change – lessons learnt / experiences</p>
<p>Realize that the system is an obstacle, not a help</p> <p>Performance bonus,</p> <p>In our Department there was probably a serious lack in innovation, and to some extent still is. I find certain structures in the University do not support innovation: one of them is definitely finances and procurement. These processes have become so full of "red tape" in the last few years that it stifles innovation</p>	<p>The structure and systems of an organisation</p>
<p>Need to work as a team – following an interdisciplinary approach.</p> <p>It is left to the individual members' discretion to decide to innovate and how to approach it.</p> <p>Until the checklist culture is addressed, that will merely allow people to pay lip service to things they are not committed to and do not understand, but to simultaneously equip them to pretend that they do or even believe that they do. Innovation is more a mind-set than a field with terminology, to my mind, in any event.</p> <p>, individuals may be hesitant to innovate if this is not encouraged by the organisational culture (which in academia often resists innovation) and if time and other resources are not available to bring innovative ideas to fruition; At UP, academics are essentially encouraged to innovate in terms of their research, but much less to in terms of their teaching and other responsibilities.</p> <p>A culture of wanting to innovate and of recognising and celebrating innovation is important.</p> <p>Knowledge sharing and team-work is also important. A realisation that "we have to make things happen ourselves" is also important;</p> <p>There is no formal process of innovation in my department. My own innovations have largely happened in isolation without the knowledge and involvement of my colleagues.</p> <p>My feeling is that we have what I can only describe as a paranoid management culture. Small mistakes are criticized MUCH MUCH MUCH more than even great successes are praised or even acknowledged. A conservative (in some regards) personal view on things is enforced. In short, creativity is not truly nurtured and risk is avoided at all costs – or at least passed on to others</p> <p>The Department most inclined to address dire health care needs</p>	<p>Organisational culture</p>
<p>I think the general staff structures and work ethics etc. support innovation; Cannot be done in my opinion. It comes from inside the innovator. If you told me: "Innovate!", I would still be wondering how. It is a culture, or a value if you may.</p> <p>Everyone is left to their own devices to innovate;</p> <p>Marketing of e-resources and the use and application of new products. The most recent example was the Overdrive project. A lot of role players were involved in the project; The Department of Library Services has a very positive attitude towards risk and knowledge sharing. Personnel members are allowed to innovate and try out new products and services;</p> <p>Continuity from 1st to final years. Movement away from disciplines to holistic clinical training.</p> <p>Oversight over years; control over own subject; difficult to influence (small sphere of influence); address risks - steals a lot of energy / those that do not innovate; issues are not extrapolated to the population; nature of occupation does not influence, rather dependant on your brain;</p> <p>barrier in UP: focus on 1% students 20/80 principle</p>	<p>Organisational climate;</p>
<p>More support from the Head of Department and Faculty. Mentorship and encouragement are essential factors. More guidance and info on the structures and regulations; The positive attitude of the Dean and the support by students and teaching assistants; Although</p> <p>Innovation is essential in Higher Education, I feel staff are overwhelmed by every day responsibilities and not many venture into new avenues.</p> <p>The support of an excellent team leader to drive the entire process, work very well.</p>	<p>Leadership</p>

<p>Support from peers and departmental head Innovation is mostly reliant on the individual driving the initiative. However, when the department supports such initiatives then there is often room for discussion on these innovations which might spark some additional. Ideas for others to also implement innovation processes. Innovation is done on an ad hoc base. Innovation is more driven by an individual and to a lesser extend processes; We do not have a change process – innovation is handled at an ad hoc basis -driven by the individual that want to innovate and supported by management. I found it to be not very supportive and it seems a lonely road..? Although my head of Dept. allowed me to start the initiative, I did not receive support initially. On the contrary, I had to fight the system and find my own funding. Eventually, as the project became more successful, I had the support of management. Colleagues were never really interested in collaboration and I think this can be very demotivating for staff. It means extra work, less publication time, and less promotion opportunities. Eventually I found support through the US Embassy. Had it not been for the financial backing of my ex- husband's mining company, I would never have been able to implement this. I needed busses to the projects and could not secure funding. After one year of successful implementation, I received backing from DIA and later from the Dept. of Community Engagement. If it is strategic HOD is very supportive (leadership). Manages conflict - people are hostile towards you. Believes and support me. Had to keep relationship with HOD a secret - manage other people The Dean gave the opportunity to implement the Engage Programme because there was money available from the DHET for a period of three years. At present the Engage staff still has to "convince" him that the programme is actually achieving the desired results; Understanding: Implementing something new, different and ingenious in order to improve on existing ways of doing.</p>	
<p>Rewarded indirectly by Faculty and rewarded by institution. Through Innovation awards. However, only a few winners. It does not really encourage new staff members to do so. Yes, by the Dean's award. Yes, as part of my performance management system The Department of Library Services has a very positive attitude towards innovation Superficially – but recognition and rewards only if shared with others / higher ups.; Superficially; Academic achievement leads to recognition - naturally all part of students. As it does not really bring promotion or any financial rewards, why would staff do it?</p>	<p>Reward system</p>
<p>Do it from a perspective of professional development as the institution values/rewards are differently orientated. E.g. although the EI awards are supposed to have a developmental approach, they do not. E.g. it is difficult / impossible to get feedback from the reviewers to use for future improvements. As a result the EI awards are more like a competition than a step to improving practice. continuity is a problem / The faculty sometimes resists this: feeling often is that we have been more innovative than other faculties and are bound by directives of Health Dept. rather than university It is left to the individual members' discretion to decide to innovate and how to approach it. Definitely own discretion and not really enhanced. We have a lot of autonomy in what we do in our courses therefore we have a mandate to change things with the support of the head of the department but they are always open for new ways of doing things. We've had an "idea competition" in the Faculty before to stimulate innovative thinking, but people became disillusioned because most of the "award winning ideas" were never implemented. In my view, innovation is quite often left to the individual members' discretion, who could be the HOD or a staff member. Approach: to firstly brainstorm the idea/intervention with colleagues and peers and discuss the viability thereof. If buy-in is achieved, the HOD or programme coordinator will assign a small task team to plan the intervention (which could include further research, discussions with peers and other stakeholders (such as education experts) and training). The task team is responsible for the implementation of the intervention. The individual member or the task team will then reflect on the strengths and weaknesses of the intervention and make the necessary adjustments accordingly Must be more visible and be communicated. Maybe - adoption and Faculty-based approach Know only about own processes, experiences. Not aware of any Marketing we have this concept call customer centric and I think for innovation this works really well in our department. We put students at the centre of our teaching initiatives and based on their experiences we adapt, adjust and maybe change all together There is no formal process for innovation within the department however it supports the bi-annual education innovation awards entries. Mostly the integration of course management system (CMS), such as WebCT or Blackboard. Not many new, original concepts are introduced The students are asked to evaluate the module at the end of each semester, and based on their feedback and constructive criticism the curriculum is then tweaked and fine-tuned; Some of my colleagues, like to innovate in an informal team. They identify, discuss and develop innovations informally in a team of two Innovations tend to be spontaneous and informal and not the result of structured processes. We have had a formal "idea generation" competition in the Faculty before, but people became disillusioned because many of the "award winning ideas" were never implemented. Our Department is open to aspects of innovation around teaching, research and community</p>	<p>Business processes</p>

<p>service. Specifically around teaching and research practices, many workshops, brainstorming sessions, strategic planning sessions, one-to-one discussions, consultations with education experts, practitioners and peers have resulted in identifying opportunities for improvement and revising teaching and research practices which are innovative ways of doing things within the academic discipline of auditing. The process is similar to the action research process/cycle of planning, implementing, reflecting and improving</p> <p>An innovative intervention (based on a need) is usually identified by an individual or group of individuals within the Department or with consultation from external stakeholders, a plan is prepared by a working group, it is implemented and after implementation, the working group will reflect on the outcomes of the intervention, identify improvements or weaknesses, and make the necessary adjustments before implementing the revised intervention.</p> <p>I prefer to innovate as a part of my professional practice so I have no clue to what enabling factors are created by the dept./school etc. as I have academic autonomy.</p>	
<p>Even while the current system is working well, small changes (incremental). Innovation does not happen overnight – it is a continuous process of planning, implementation, reflection and re-planning. Stay positive and be patient - the end result is magnificent! Planning is crucial and having someone to act as a soundboard It would be nice if UP could host a teaching innovation symposium (perhaps every two years or so) where we can be exposed to world-renowned teaching innovators who have managed to successfully implement innovations that are appropriate for realities similar to ours</p>	<p>Suggestions For UP regarding innovation</p>
<p>Students should be given the opportunity to be innovative in their own learning. Innovation and creativity over lapse and if students do not know how to change or try something different they will struggle to overcome challenges in the workplace It is very important for students to experience and recognise the value of innovation Innovation greatly influences the student learning experience as it enhances student motivation and achievement, whilst creating reinforcement for future career opportunities. It is expected of students to be innovative once they join the workforce thus being expose to innovation is critical. Very important. If we want to send students into the job market, they need to be well prepared. Students are changing and we have to innovate to keep up with their changing needs. It is critical for students to experience innovation within an academic environment. Based on our innovation adoption, the students who have been exposed to our innovative teaching practices claimed enhanced knowledge and skills that are in demand in the labour market. Employers in the workplace lamented on the improved communication competencies of UP students recruited. Horizon report 2012 game based learning can improve certain skills such as collaboration, problem solving, communication, critical thinking and digital literacy. These skills can be beneficial for HE students to prepare them for the industry. Critical thinking, system thinking and collaboration can be very important skills for the 21st Century. showing rapid change and preparing them for the idea that the world is constantly changing, as would be their careers If we expect our graduates to be able to respond to future challenges and yet unseen realities, then it is essential that they experience innovation and change and can use their agency to bring about change in an unjust society. Forming process, active participation, variation, costs of material - tins open ended material, practical classes - paint with straws Extremely important in view of dire need of Health care Research made respopndent a critical thinker, recognises other opinions. Changed way of thinking - gave skill for teaching (open to others opinions). More critical</p>	<p>Discourse of labour economics with regards to innovation adoption</p>

APPENDIX B: Detailed secondary objectives.

<p>Understand how academia makes sense of innovation and the adoption thereof. Academics mostly understand the adoption of innovation in response to a 'problem' or trying to survive in their environment</p>	<ul style="list-style-type: none"> • Innovate by “accident” not planned. Get students to work with you • Experiential training - ‘real life’ industry challenges • Using new tools to do something, not necessarily electronic devices • Designing a learning space as a sharing platform with virtual teams • Augmenting modules and skills-based modules- implementing something new, different and ingenious in order to improve on existing ways of doing • Blended education approach - aimed to put a career and research focus on education • Environment that value teamwork - This helps students to become independent learners, co-producing learning with the client and the facilitator while using creative problem-solving. • Process of trial and error - took a new idea and implemented it effectively and successfully after reflecting on what did not work and why • Presentations Workshop - engagement between students, lecturers and internal audit practitioners and promoting active and collaborative learning • Customized game for the students to apply creativity based on research in that specific area. Creating or synthesizing a new solution to a problem • The ability to respond to a situation in a way that brings new understanding (of the problem; of the people; of the practice) • Implementation of the learning area technology in primary schools in Gauteng and Free State provinces. Creative, new fresh look at an approach to transfer knowledge to student • An intervention in an existing tuition structure with the purpose of making study material accessible and relevant • Cross-Cultural Language Enrichment (CCLE) to empower learners to enrich their command of English • Projects based on innovative teaching strategies
<ul style="list-style-type: none"> • Understanding: inspire students to become involved with and participate in the subject that I teach. You need to be passionate about your subject and about how your students are experiencing it. If it does not matter to you it won't matter to them either. The trick is to get them on the 'bandwagon' so to speak, with you – for then you both begin to care about the same thing and it matters to both you and your students and teaching becomes a shared learning experience not to be missed for anything. • We modelled our Honours programme on themes related to the essence of marketing challenging students with 'real life' industry challenges, thus emphasizing experiential learning. The process of innovation especially in an academic environment is often driven by the individual once shared there might be some support from another colleague who is open to journey with you on this new endeavor. Innovation is the constant enquiry into the relevance of what I am teaching and how effective it is (from a teaching point of view) • Breaking loose from a traditional method of doing something, and start a new way of reaching the same or a higher goal, which is more in line with the current environment. Innovation means using new tools to do something, although these tools need not necessarily be electronic devices, computers or such, which some people now see as synonymous with the term “innovation”. • Designing a learning space as a sharing platform where virtual teams can access resources, post contributions, read and respond to discussion threads, store their work in progress, receive feedback, inform instructors on team progress, reflect on learning experiences, and socialize. This project provides students with a practical and realistic experience in virtual communication and collaboration with peers from different cultures. Outcome: Greater awareness and sensitivity to other cultures (including academic ones), higher technology and interpersonal tolerance, better understanding of student motivations and teamwork issues, and an expanded perspective on the global textile and apparel industry. Innovation is re-conceptualizing, re-designing and re-defining old ways of teaching, creating something new and original to make an impact, challenging the system of old thoughts, a necessity to get students ready for industry. • The design of ENGAGE is underpinned by the following principles: <ol style="list-style-type: none"> 1. Students should be supported in making the transition from high school to university. 2. Student workload (time students spend working) should be high throughout. 3. The volume of work (amount of content covered) should be low initially and increase over time. 4. Support should be high initially and decrease over time. 5. Students should encounter familiar subjects early in the program, less familiar subjects later on. Two types of developmental modules are offered - augmenting modules and skills-based modules, addressing the necessary background knowledge and to develop the conceptual understanding and problem-solving skills needed to succeed in the accompanying mainstream modules. Innovation in this sense was implementing something new, different and ingenious in order to improve on existing ways of doing. • The TEARS approach aimed to put a career and research focus on education. The TEARS principal satisfied the requirements for education innovation in the way of education, careers, research and community services; In order to truly be innovative in education, it is at times necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. We support the notion that innovation in teaching and learning plays a vital role in the success of an institution; therefore we have launched innovative initiatives inside our own practice which closely relate to teaching challenges within the UP context. Benefit was the blended educational approach which allows for widened participation of students, thus 	

making way for local, national and international involvement.

- We modelled our Honours programme on themes related to the essence of marketing where industry plays a central role to work with us and challenge our students with 'real life' industry challenges, thus emphasizing experiential learning. Most working environments value teamwork therefore we encourage, emphasize and help students to function well within a team and thus the importance of developing these skills. Students also receive qualitative feedback from their group members on their strengths and weaknesses. A number of managerial, individual and leadership skills are developed and identified with this model. The students thus benefit from embedded learning in social experiences, in a realistic context through team challenges as well as interaction with real clients from industry. This type of class helps students to become independent learners, co-producing learning with the client and the facilitator while using creative problem-solving. The partnership with industry builds the reputation of the faculty, department and marketing graduates. Innovation is doing things more effective, efficient and a new way.
- It was a process of trial and error and I did not ask permission for many ideas I implemented. Innovation is to take a new idea and implement it effectively and successfully after reflecting on what did not work and why. It is the search for a better way to achieve maximum results innovation is that which makes you excited again about your everyday job and thus essential for growth and job satisfaction. There is a lot of scope for innovation in academia, but one should realize that you cannot wait for others to make it happen. If you see a need for innovation or change, then jump in and do it yourself; Innovation is a changing processes, procedures, or current way's doing things to ensure greater efficiency and effectiveness. What exactly efficiency and effectiveness mean will differ from one case to another, essentially it is finding ways to do your work faster, with less effort, at a lower cost and/or with a higher impact.
- The innovation a practical, hands-on business communication course for internal audit postgraduate students. The purpose is to address the need identified in the workplace for professional internal auditors with excellent communication and secondly, to improve the business communication competencies of internal audit students. Impact on learning and sustainability: This innovation influenced, motivated and inspired student learning over a sustained period of time and it can be replicated. A learning community was established inviting engagement between students, lecturers and internal audit practitioners and promoting active and collaborative learning. The objectives of the "Presentations Workshop" are to give students the opportunity to practice and improve their presentation skills, to study a number of internal auditing topics and to enhance their teamwork skills. The students also gain experience to work effectively in diverse groups, as well as working with the pressure of limited preparation time and long hours of concentration. Students had to reflect on their professional behavior, reviewing their attributes and approaches which acquires a deep level of reflection which resulted in behavioral change. The lecturers involved in the teaching and facilitation of the business communication course applied both conventional and unconventional teaching practices as well as reflective practices to continuously improve the teaching process. The innovation is based on exceptional and innovative instructional practices that respond to the teaching and learning challenges within the UP learning environment and beyond. Innovation adoption in my view refers to the implementation of a new, unique teaching or learning intervention that has a positive impact on teaching and/or learning practices. Innovation is - thinking and doing in new, unique, creative and integrated ways to teach, assess, research and learn.
- Creating a customized game specifically for the students of the University of Pretoria. The impact seems to be high. Innovation is to apply creativity based on research in that specific area. I'm not an academic. I consider myself to also be an academic, but the faculty actively opposes my being recognized as such.; Short version of the experience: people don't want to do anything, certainly don't want to take any responsibility if things go wrong, but if things seem to be going well they want to be there, get the credit and pretend they supported it all along. It's a thankless thing and you have to feel passionate about what you are trying to achieve or you won't have the fuel to fight the system / people to allow you "To me innovation is Innovation is creating or synthesizing a new solution to a problem (which might be simply how to optimize something)
- One must be personally motivated and able to do the work necessary within your own team as the university (as a whole) only really gets involved in judging the product (via the EI awards) and not in supporting innovation. Secondly the constant threats that one must do research (and not teaching) put many off engaging in long-term transformation of teaching practices. ; The ability to respond to a situation in a way that brings new understanding (of the problem; of the people; of the practice)
- Review CD / Leadership / Performance management - instrument for T and L evaluation / Large classes / Courses unable to attend - where presented, more than one opportunity and give choices; Lonely process, Took a long time not difficult, do not have evidence of everything such as reflections of students, To do material need master's degree; To me innovation is creative, new fresh look at an approach to transfer knowledge to student.
- I miss research in my field of specialization but this is compensated by the gratitude on the part of the students realizing their own potential. Innovation is ... an intervention in an existing tuition structure with the purpose of making study material accessible and relevant.
- Cross-Cultural Language Enrichment (CCLE) to empower learners to enrich their command of English language through cross-cultural and linguistic studies based on the Roman World in comparison to the African Culture.; You must believe in your project, be sure of the outcomes and thus have a passion to promote it. ; "To me innovation isWhat Einstein said: "It is easy to explain a difficult concept in a difficult way, but it is difficult to explain a difficult concept in an easy way." Therefore your innovation must be understood by academics as well as learners.
- Younger people innovate, difficult to convince older people. Antagonism in Dept. is bad. You changed but there is no acknowledgement. Let go ' my idea'. Manage people and convince them through relationships, communication. Very little emotional intelligence; People don't see you are fighting a war, looked around, build own career - make own mistakes. People at UP don't want to achieve anything. 1% focus lets innovation fail (e.g. SPAR). Do not conform. Complement each other e.g. learn technical knowledge (listen) not T and L (know automatic, not learn); Teaching not a discipline, just transfer discipline. Cannot measure product. Don't need to give attention. Students top performers - not all the skills. Teach to test - employers problems - not meet expectations

Construct perspectives about innovation adoption in the institutional functions as reflected in the institutional strategy	<ul style="list-style-type: none"> • Innovation is a 'solo' process and is done by individuals. • Colleagues were never really interested in collaboration, and I think this can be very demotivating for staff. • It means extra work, less publication time, and less promotion opportunities • There is no formal innovation strategy in the institution and therefore academic staff is not measured on their innovation adoption. • I found it to be not very supportive and it seems a lonely road
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	<ul style="list-style-type: none"> • I had to fight the system and find my own funding • What I experienced is trial and error, finding things out the hard way and just going ahead blindly • Side stepped red tape - is a huge risk • Support and recognition superficially • Individual members' use their own discretion to decide to innovate and how to approach it and it is not really enhanced. • HOD usually supports. • Department/Faculty encourages innovation but do not necessary have a specific approach. • Some tension exists between the expectations of the institution as reflected in the UP strategy and the operational realities that face academics in the class. Academics also perceive that there is no support or recognition for them. The risk of innovating and trying out new things is not tolerated. • Staff are overwhelmed by every day responsibilities and not many venture into new avenues • Approach in one Department: <ul style="list-style-type: none"> ○ firstly brainstorm the idea/intervention with colleagues and peers and discuss the viability thereof. ○ If buy-in is achieved, the HOD or programme coordinator will assign a small task team to plan the intervention (which could include further research, discussions with peers and other stakeholders (such as education experts) and training). ○ The task team is responsible for the implementation of the intervention. The individual member or the task team will then reflect on the strengths and weaknesses of the intervention and make the necessary adjustments accordingly. • My own approach is one of visualizing what I would like to see in my practice and then to use action research to achieve this • We are dependent on the guidelines, policies of the Department of Health and the professional body (HPCSA)
	<ul style="list-style-type: none"> • I found it to be not very supportive and it seems a lonely road..? Although my HOD allowed me to start the initiative, I did not receive support initially. On the contrary, I had to fight the system and find my own funding. Eventually, as the project became more successful, I had the support of management. Colleagues were never really interested in collaboration, and I think this can be very demotivating for staff. It means extra work, less publication time, and less promotion opportunities. Eventually I found support through the US Embassy. Had it not been for the financial backing of my ex-husband's mining company, I would never have been able to implement this. I needed buses to the projects and could not secure funding. After one year of successful implementation, I received backing from DIA and later from the Dept. of Community Engagement. However, all these venues I had to find on my own; Not sure here..? What I experienced is trial and error, finding things out the hard way and just going ahead blindly.... • Superficially – but recognition and rewards only if shared with others / higher up.; Superficially; Education Innovation Awards helps a lot. • Not sure if I would be able to sidestep the red tape. It is a huge risk. • More support from the Head of Department and Faculty. Mentorship and encouragement are essential factors. More guidance and info on the structures and regulations; The positive attitude of the Dean and the support by students and teaching assistants; • Although Innovation is essential in Higher Education, I feel staff is overwhelmed by every day responsibilities and not many venture into new avenues. Furthermore there is a lot of red tape that lecturers have to face to bring in new ideas. Sometimes staff gets discouraged and just give up, e.g. my one colleague who tried to implement a new field of study in Literacy. She designed a new programme, went through hours and hours and eventually it was not accepted. Such wasted efforts which are not recognized, demotivates people and not many academics will try something similar again. There is too much risk for lecturers to start new ventures so many opt not to do it. As it does not really bring promotion or any financial rewards, why would staff do it? It only creates extra work and more responsibilities. In my case, the innovation might disappear, as there are no colleagues interested in taking on the extra workload and responsibilities. • I'm not sure I understand the question. I can't answer.; I don't know about the faculty at large. My feeling is that we have what I can only describe as a paranoid management culture. Small mistakes are critized MUCH MUCH MUCH more than even great successes are praised or even acknowledged. A conservative (in some regards) personal view on things are enforced. In short, creativity is not truly nurtured and risk is avoided at all costs – or at least passed on to others.; I can't answer • It is left to the individual members' discretion to decide to innovate and how to approach it • We have a lot of autonomy in what we do in our courses therefore we have a mandate to change things with the support of the head of the department but they are always open for new ways of doing things. • Left to the individual. • I think my Department/Faculty encourage innovation but do not necessary have a specific approach. Your mostly decide on the how, what and when. • It is left to the individual members' discretion to decide to innovate and the approach that they want to follow • Definitely own discretion and not really enhanced.

- It is largely left to individuals to innovate on their own. We've had an "idea competition" in the Faculty before to stimulate innovative thinking, but people became disillusioned because most of the "award winning ideas" were never implemented. If people cannot see innovation happen in a realistic period of time, they become despondent.
- In my view, innovation is quite often left to the individual members' discretion, who could be the HOD or a staff member. Approach: to firstly brainstorm the idea/intervention with colleagues and peers and discuss the viability thereof. If buy-in is achieved, the HOD or programme coordinator will assign a small task team to plan the intervention (which could include further research, discussions with peers and other stakeholders (such as education experts) and training). The task team is responsible for the implementation of the intervention. The individual member or the task team will then reflect on the strengths and weaknesses of the intervention and make the necessary adjustments accordingly.
- It is left to the individual members' discretion to decide to innovate and how they approach it. My own approach is one of visualising what I would like to see in my practice and then to use action research to achieve this.
- Not phase expert. Individual. Not go for guidance. Vice - dean changed everything. Do not recognise own experience
- We are dependant on the guidelines, policies of the Department of Health and the HPCSA. Some departments resist these more than others. The old paradigm of making a medical practitioner a 'specialist' persists
- We approach new innovation projects ourselves in the Academia Latina.

<p>Explore the relevant organisational characteristics that foster employees' entrepreneurship leading to innovation adoption and how members of the institution respond to these characteristics to maximise innovation adoption</p>	<p>Such characteristics are:</p> <ul style="list-style-type: none"> • Professional bodies that ask academics and their programmes to comply or loose accreditation • Advisory boards (future employers) that guide and lead academics to innovate to make their student marketable • Educational studies that enlighten academics on new ways of doing things such as the PGCHE programme • Changes in structure in Department or in responsibilities • Students admitted in the institution and addressing their needs • Small sphere of influence as a result of the occupational characteristic "academic freedom" and the consensus nature of work in institution • To address risks as well as managing those that do not innovate - steals a lot of energy • Issues are not extrapolated to the population • improve on the current model by streamlining some of the outcomes, evaluation and specification of the challenges • Being able to change the structure of how things are done in institution • Networking with possible partners; • Competent, committed and experienced course facilitator and programme coordinators • Tutor system to support academic programme • Taking holistic approach (big picture) • Game-based learning • Experiential training • Service-learning model • Student feedback forms • Allow specialization / Time, space, support and recognition and appreciation. • Performance Management system
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- Exposure to academic service-learning while doing the PGCHE.
- In 2007 I attended the PGCHE with Prof Blitz from Family Medicine and at the end of the programme we had decided to try to use a service-learning teaching and learning strategy to bring about the change in the module as the module had declined steadily over the intervening years and was at that time the worst rated module in the entire medical curriculum. By this point in time I had gained more control over the SHSPH contribution and could effect change. Recognition for effort; More responsibility. New module, games and exhibitions of student work
- My realization that our society is in flux still grappling with tragic racist history. My experience in Germany provided ideological roots. I tried to insue my students with self-assertion: by contextualizing material in own language and culture attempted to show them this by no means inferior to English
- The decision of RSA Government to cancel Latin as pre-requisite for Law and The Department of Education in South Africa who stopped Latin in Secondary Schools for financial reasons.; Because of the poor English proficiency on elementary, secondary and tertiary level, I personally initiated and was co-author of "Forward to the Past" based on a communitative approach and aims at proving writing, speaking, reading and listening skills. The lessons allow individual activities and group activities. The level of the programme depends on learners' command of English.
- Oversight over years. Control over own subject. Do not have authority - award gave authority. Difficult to influence (small sphere of influence). To address risks - steals a lot of energy / those that do not innovate. Issues are not extrapolated to the population. Nature of occupation does not influence, rather dependent on your brain. Barrier: focus on 1% students 20/80 principle
- Since they are mostly drama students or students interested in drama being able to perform in front of a live audience was an added incentive.
- Challenges both client and in-class based activities; We would like to improve on the current model by streamlining some of the

<p>outcomes, evaluation and specification of the challenges; One often only sees the value of something the second or third time you offer the course and therefore although you need to improve every time one should not change fundamentally within two years.</p> <ul style="list-style-type: none"> • Group work, Competition work, Practical (hands-on) project with animals, Holistic approach (whole process experienced practically, so that the students could see the bigger picture), Soft skills development • Experiential and collaborative learning. Virtual teamwork in a computer-mediated environment; nothing; Scope of assignments • Making use of additional modules instead of just regular tutor groups making use of lecturers who are not only knowledgeable in their academic fields but who are also passionate about teaching and the development of student potential; The need for this type of programme is growing nationally. The Engage programme cannot be extended (we already have 400 students) but should certainly be maintained in the future • We plan on making small adjustments and to add a fresh new angle for next year to ensure that the innovation stays new • Networking with possible partners; • Competent, committed and experienced course facilitator and programme coordinator; Inputs from practitioners and academia / Structured planning and implementation process / Experiential learning tool – “learning by doing” workshop; funding to use external service providers when internal service providers cannot provide the service for example funding a teaching replacement to enable staff members to develop and implement an innovation; • Game based learning software was used as an intervention tool. Strategic planning and implementation of the intervention tool was necessary to make the product available for the target group. Collaboration with the gate keeper in this case the Department of Library Services was crucial for the success of the intervention. Choosing the right unit of analysis in this case the first year students of the University of Pretoria was important to be able to proof that the intervention contribute to their learning experience./ The requests for more games can justify the innovation adoption of this specific intervention. • I developed almost all the tools I used myself • A service-learning strategy was used. The basic service-learning model has been sustained already (2008 to present) • Reflections, pink forms (feedback, photos / don't expect every-one to be experts in every field. Allow specialization / Time, space, support and recognition and appreciation. Performance Management system. Unrealistic expectations top-down approach 	
<p>Explore how the creative process / capabilities vary in the institution (routines and processes)</p>	<ul style="list-style-type: none"> • My Department/Faculty encourages innovation but does not necessary have a specific approach. Academics mostly decide on the how, what and when. • Know only about own processes, experiences. Not aware of any • In marketing we have this concept call customer centric and I think for innovation this works really well. Involve students and other stakeholders • Innovation is mostly reliant on the individual driving the initiative. However, when the department supports such initiatives then there is often room for discussion on these innovations which might spark some additional ideas for others to also implement innovation processes. • There is no formal process for innovation within the department however it supports the bi-annual education innovation awards entries. • In our Department there was probably a serious lack in innovation, and to some extent still is • I find certain structures in the University do not support innovation: one of them is definitely finances and procurement. These processes have become so full of “red tape” in the last few years that it stifles innovation • Everyone is left to their own devices to innovate • I don't have enough experience in the workings of the faculty as a whole to answer this question; • We do not have a change process – innovation is handled at an ad hoc basis • Knowledge sharing and team-work is also important • A realisation that “we have to make things happen ourselves” is also important; • Innovation is more driven by an individual and to a lesser extend processes; We do not have a change process – innovation is handled at an ad hoc basis -driven by the individual that want to innovate and supported by management. • Marketing of e-resources and the use and application of new products • My own innovations have largely happened in isolation without the knowledge and involvement of my colleagues. • We have had a formal “idea generation” competition in the Faculty before, but people became disillusioned because many of the “award winning ideas” were never implemented. • A conservative (in some regards) personal view on things are enforced
<ul style="list-style-type: none"> • I think my Department/Faculty encourage innovation but do not necessary have a specific approach. Your mostly decide on the how, what and when. • Know only about own processes, experiences. Not aware of any 	

- In marketing we have this concept call customer centric and I think for innovation this works really well in our department. We put students at the center of our teaching initiatives and based on their experiences we adapt, adjust and maybe change all together, however it is never only their input that is taken into account other stakeholders are also asked. Innovation is mostly reliant on the individual driving the initiative. However, when the department supports such initiatives then there is often room for discussion on these innovations which might spark some additional ideas for others to also implement innovation processes. Innovation is done on an ad hoc base. There is no formal process for innovation within the department however it supports the bi-annual education innovation awards entries.
- I do not believe that innovation is something that can be planned, structured or forced. It can at best be stimulated and nurtured. Some people are natural innovators, and will always try new methods: sometimes successful and other times not. Other people will be too scared and rely on old methods. In our Department there was probably a serious lack in innovation, and to some extent still is. I find certain structures in the University do not support innovation: one of them is definitely finances and procurement. These processes have become so full of “red tape” in the last few years that it stifles innovation. I think the general staff structures and work ethics etc. support innovation; cannot be done in my opinion. It comes from inside the innovator. If you told me: “Innovate!”, I would still be wondering how. It is a culture or a value if you may.
- Mostly the integration of course management system (CMS), such as WebCT or Blackboard. Not many new, original concepts are introduced. Everyone is left to their own devices to innovate; I don’t think since I have been at UP (13 years) any workshops or presentations or courses about innovation were presented.
- Engage supports and follows the CDIO approach in Engineering teaching which is the predominant approach in most of the best engineering faculties in the third world; Unsure – I don’t have enough experience in the workings of the faculty as a whole to answer this question; All the Engage lecturing staff are continuously focusing on the refinement of the curriculum in their various modules. Since the additional modules did not exist before the onset of the Engage programme, completely need curricula had to be generated, in such a way that they build into the curriculum used in the mainstream module. Frequent consultations with mainstream lecturers ensure direct communication lines and that the curriculum is paced in sync with the mainstream module. Semester tests and assignments are also constructed in close collaboration with main stream lecturers. The students are asked to evaluate the module at the end of each semester, and based on their feedback and constructive criticism the curriculum is then tweaked and fine-tuned; The content and structure of the Engage programme has been finalized, but each curriculum has evolved over the past three years, and is still undergoing changes to improve on the quality of the teaching and facilitation that is provided to students.
 - Learning options that are better aligned with the learning needs of students (flexible learning modes)
 - Increased enrolment and successful graduation of post-graduate students
 - Increased publications, scientific contribution and research outputs of students
 - Increased career opportunities for undergraduate and post-graduate students
 - Increased practical experience and opportunities to apply practical skills and knowledge
 - Increased community involvement and engagement via community upliftment projects;
- Increased practical experience and opportunities to apply practical skills and knowledge. Use the HELP principle, H: Help for, E: Everyone, L: Must be for a Lifetime, P: Must address Personal needs
- Innovation is more driven by an individual and to a lesser extend processes; We do not have a change process – innovation is handled at an ad hoc basis -driven by the individual that want to innovate and supported by management.
- I found it to be not very supportive and it seems a lonely road..? Although my head of Dept allowed me to start the initiative, I did not receive support initially. On the contrary, I had to fight the system and find my own funding. Eventually, as the project became more successful, I had the support of management. Colleagues were never really interested in collaboration, and I think this can be very demotivating for staff. It means extra work, less publication time, and less promotion opportunities. Eventually I found support through the US Embassy. Had it not been for the financial backing of my ex-husband’s mining company, I would never have been able to implement this. I needed buses to the projects and could not secure funding. After one year of successful implementation, I received backing from DIA and later from the Dept of Community Engagement. However, all these venues I had to find on my own; Not sure here..? What I experienced is trial and error, finding things out the hard way and just going ahead blindly....
- Innovations that are self-initiated work best because then the people involved have taken ownership and want change to happen; A culture of wanting to innovate and of recognizing and celebrating innovation is important. Knowledge sharing and team-work is also important. A realisation that “we have to make things happen ourselves” is also important; There is no formal process of innovation in my department. My own innovations have largely happened in isolation without the knowledge and involvement of my colleagues. Some of my colleagues, like to innovate in an informal team. They identify, discuss and develop innovations informally in a team of two. Innovations tend to be spontaneous and informal and not the result of structured processes. We have had a formal “idea generation” competition in the Faculty before, but people became disillusioned because many of the “award winning ideas” were never implemented.
- Our Department is open to aspects of innovation around teaching, research and community service. Specifically around teaching and research practices, many workshops, brainstorming sessions, strategic planning sessions, one-to-one discussions, consultations with education experts, practitioners and peers have resulted in identifying opportunities for improvement and revising teaching and research practices which are innovative ways of doing things within the academic discipline of auditing. The process is similar to the action research process/cycle of planning, implementing, reflecting and improving. An innovative intervention (based on a need) is usually identified by an individual or group of individuals within the Department or with consultation from external stakeholders, a plan is prepared by a working group, it is implemented and after implementation, the working group will reflect on the outcomes of the intervention, identify improvements or weaknesses, and make the necessary adjustments before implementing the revised intervention. To me, innovative ways of thinking is critical to being a successful academic. Without innovations in teaching, research and community service, I believe that an academic will not be able to address the changing needs and expectations of various stakeholders –students, employers, practitioners, government etc.
- Marketing of e-resources and the use and application of new products. The most recent example was the Overdrive project. A lot of role players were involved in the project; The Department of Library Services has a very positive attitude towards risk and knowledge sharing. Personnel members are allowed to innovate and try out new products and services; One example of the innovation/change process in the e-services unit can be seen below.
- I don’t know about the faculty at large. My feeling is that we have what I can only describe as a paranoid management culture. Small mistakes are criticized MUCH MUCH MUCH more than even great successes are praised or even acknowledged. A

<p>conservative (in some regards) personal view on things are enforced. In short, creativity is not truly nurtured and risk is avoided at all costs – or at least passed on to others.; I can't answer</p> <ul style="list-style-type: none"> • The use of the phrase 'innovation adoption' implies that others have 'innovated' and the school/dept then 'adopts' it by implementing the same. I prefer to innovate as a part of my professional practice so I have no clue to what enabling factors are created by the dept/school etc as I have academic autonomy. • Freedom to develop modules. Not restricted in content. Not prescriptive; Attend conferences / percentage of students must pass / workload and time are constricting factors. Some individuals (e.g. order books) / Work as individual, very creative but kept back by too many students, Change constant (OBE / capstone). Large classes fall back on old ways (games) , Not own classroom • Academic achievement leads to recognition - naturally all part of students. Family medicine. The Department most inclined to address dire health care needs. Continuity from 1st to final years. Movement away from disciplines to holistic clinical training • In the Academia Latina we experience that English is increasingly becoming the most important medium of communication in our country. It is our intention to expand "Forward to the Past" and focus on disadvantaged and other students to augment their skills. Knowledge of the project of the Academia Latina. • Perception of experience versus knowledge. Not CA qualification, difficult to measure - avoided. Must first pilot to ensure it works. Consequences if it is not implemented; If it is strategic HOD is very supportive (leadership). Manages conflict - people are hostile towards you. Believes and support me. Had to keep relationship with HOD a secret - manage other people. Try a different way - move away from extra recognition, people hostile towards innovation, intrinsic motivation 	
<p>Interpret the when, why and how of innovation adoption in the functions of the institution</p>	<ul style="list-style-type: none"> • To some extent it is a responsibility of an applied academic to try and help students to make a smooth transition into the work place. • By knowing what some of the skills required by industry is • Research, industry input and international trends motivated this innovation and incorporation into our new curriculum design. • My desire to make a difference when I was given a responsible position. I didn't want to be just another course coordinator • criticism about our Faculty's poor ability to stimulate the interest of our students in rural practice. • Multinational virtual teams typically have to rely on computer-mediated rather than traditional face-to-face communication, facing challenges in areas such as effective communication, information sharing, cultural differences, and time differences as well as overcoming technology issues. • Poor results • After receiving a Foundation grant • Students struggling to find a job after obtaining their degree; The necessity behind the educational innovation was to accommodate the widened participation agenda, as well as create a sense of career direction or career path for those countless ambiguous students • This specific innovation was also in a reaction to try to 'simulate' the workplace to ensure that our programmes are relevant to industry. • The enthusiasm of the students, the need in the community. I was on a committee at the Vroue Federasie (Bostwadi) and met a lecturer in Social Work. We discussed the possibility of collaborating and that was how the initiative started. She had already been working on a tutoring project in Mamelodi to teach Social Work students how to start such projects, but needed tutors. • I enjoy developing solutions to practical problems or inefficiencies experienced in my day-to-day work. My "innovations" are basically the result of trying to do things "simpler, better and faster" • our exposure to other international and national teaching practices / the continuous support from the IAEP Advisory Board in the form of time and advice from practitioners on course content and teaching methods / our exposure to seminars presented by the Department for Education Innovation at UP / our teaching philosophy which focuses on competency development and "learning by doing" • I want to customize library orientation for the NET generation. My research proves that majority of first year students are experienced game players and only a small percentage were non experienced game players • I want to be the best I can be at what I do, and assist the students as well as I can – if I did not, what was the point of this career. Most of what I do seems obvious to me and the challenge is to fight the status quo as well as the 'check-box' mentality and get people to recognize the importance of the question: "What are we trying to achieve here?". Unfortunately, the answer

	<p>often seems to be to do as little as possible, not rock the boat, and do what ‘has worked for hundreds of years”, or otherwise say – they say we should innovate so do something new. It seemed intuitively obvious. I guess I often also ask myself “what subject do I wish I had as a student?” and then I try to create that subject.</p> <ul style="list-style-type: none"> • Personal dissatisfaction with the content and structure as well as the fact that the teaching was all classroom-based (therefore not contextualized for learning about health systems) and poorly attended. Secondly the module was not meeting the learning needs of the target audience - highly intelligent senior medical students who are critical and whose opinions are valued. ; Exposure to academic service-learning while doing the PGCHE. • Recognition for effort • My realization that our society is in flux still grappling with tragic racist history. My experience in Germany provided ideological roots. I tried to in sue my students with self-assertion: • The decision of RSA Government to cancel Latin as pre-requisite for Law and The Department of Education in South Africa who stopped Latin in Secondary Schools for financial reasons.; Because of the poor English proficiency on elementary, secondary and tertiary level, • Oversight over years. Control over own subject. Do not have authority • If not promoted, it's OK. Culture of UP - people don't want to build a career, come from career in industry. Compare corporate. No guidelines, not enforced, communicated. UP pays less, came as favor, spend time on making money. Money not an incentive. How higher the post level outside UP, the more difficult. Stay at UP because of a more balanced life. Non-performance is not regulated in UP (no consequences)
<ul style="list-style-type: none"> • As an academic I was gratified when I realized that the totally unorthodox method was using to teach Greek drama to students could actually be linked to the “mantle of the expert” teaching method applied by Dorothy Heathcote. My innovation experience has resulted in an article compiled together with my co-writer which has recently been published in the Teaching in Higher Education Journal Vol.00, N0. 00, Month 2012, 1-13 by Routledge. Understanding: inspire students to become involved with and participate in the subject that I teach. You need to be passionate about your subject and about how your students are experiencing it. If it does not matter to you it won't matter to them either. The trick is to get them on the ‘bandwagon’ so to speak, with you – for then you both begin to care about the same thing and it matters to both you and your students and teaching becomes a shared learning experience not to be missed for anything. • To some extent it is a responsibility of an applied academic to try and help students to make a smooth transition into the work place. By knowing what some of the skills required by industry is and also by challenging the students outside of their own ‘comfort zone’ maybe questioning some assumptions that they might have is a great motivating factor to do things differently. The world is changing constantly and these students need to be effective in such an environment and that is another motivating factor – to adjust as the environment changes. Research, industry input and international trends motivated this innovation and incorporation into our new curriculum design. • My desire to make a difference when I was given a responsible position. I didn't want to be just another course coordinator who did everything like my predecessor. I had a true desire to change the way that we teach concepts that are traditionally seen as boring and difficult to teach. In this project, the students do all the studying and research on their own, and the coordinator simply directs the project. Other factors as mentioned before: criticism about our Faculty's poor ability to stimulate the interest of our students in rural practice. Another factor was the idea of a reality project, similar to reality TV shows, as this seems to be a new kind of culture that grasps the imagination of our new generation of students. The project is based on a team competition, similar to say “Survivor” or such reality TV shows. The collaboration and camaraderie that results from this teamwork has very positive effects on the outcome of stimulating the interest of our students, as well as on their general learning experience. It also adds value by developing “soft” skills of the students simultaneously. Mentioned above. • I was approached by Elena Karpova from ISU, regarding this project at an International conference. I were immediately interested as I am always open to any new or anything original in terms of teaching. Although it was an ordeal to develop the project for 10 months via emails and between 3 different continents it was exciting and the value of the project exceeded these challenges. Multinational virtual teams typically have to rely on computer-mediated rather than traditional face-to-face communication, facing challenges in areas such as effective communication, information sharing, cultural differences, and time differences as well as overcoming technology issues. I <ul style="list-style-type: none"> • There is need for training professionals who can successfully and efficiently communicate, work together and deliver output across space, time and culture via a computer-mediated environment. • Virtual teamwork offers a new teaching and learning strategy that can address this need and prepare students to function across cultural and organizational boundaries using technology. • Going Global project was used as an instructional technique to give students in apparel/clothing undergraduate courses an experiential learning opportunity. This gave them the chance to develop relevant competencies and prepare them for future work situations in this global industry. The Going Global project was developed to address the need for a realistic experiential learning opportunity within the apparel / clothing undergraduate environment, using simulations of real-life situations, in preparing and training them for the international apparel and textile industry. • The fact the previous programme (5yp) did not give the desired results; Prof Grayson, the previous manager of the Engage Programme has extensive experience in foundation programmes and academic development. She was able to compare various models currently in use at various universities. In the light of results achieved in the various programmes she could select the Augmented/Augmenting model as the most suited choice. After receiving a Foundation grant from 2010 to 2012 from 	

the Department of Higher Education the programme could be implemented at the UP from the start of 2010.

- Students struggling to find a job after obtaining their degree; The necessity behind the educational innovation was to accommodate the widened participation agenda, as well as create a sense of career direction or career path for those countless ambiguous students. We have noticed numerous incidences where students, even at a third year level, portray uncertainty and doubt regarding their future. The initiative has been implemented to expose students to integrated modules and courses which make way for practical application of skills and knowledge whilst simultaneously increasing prospective career opportunities. Over and above these benefits students are also involved in community upliftment projects.
- I am more of a self-motivator and like to do things differently. This specific innovation was also in a reaction to try to 'simulate' the workplace to ensure that our programmes are relevant to industry. Thus adding value to our students and better equip students to ensure that they are more employable; After talking to industry and researching the approach used by other international HEI we decided the only way to prepare students to more easily transition into the workplace is to give them a practical experience and hence the real – life challenges / problems.
- The enthusiasm of the students, the need in the community and support from Education Innovation consultant!; Students needed opportunities to practice the skills discussed in the lecture hall, in real life. This would make the teaching learning experience more relevant and authentic. I was on a committee at the Vroue Federasie (Bostwadi) and met a lecturer in Social Work. We discussed the possibility of collaborating and that was how the initiative started. She had already been working on a tutoring project in Mamelodi to teach Social Work students how to start such projects, but needed tutors. A student came forward with the suggestion that students work in prisons as well, and the next project started. After that, students found new projects themselves and networking with community members started.
- I enjoy developing solutions to practical problems or inefficiencies experienced in my day-to-day work. My "innovations" are basically the result of trying to do things "simpler, better and faster"; It is very time-consuming and frustrating to evaluate the written submission (such as draft research proposals) of postgraduate students, especially since most of the students are not focused on details such as technical care and referencing. One essentially ends up doing the work of a language editor by fixing errors that students should and could have fixed themselves. My innovations are driven by the need to lessen my workload and to empower students to submit better quality work for formal evaluation.
- The following motivated us to innovate: our exposure to other international and national teaching practices / the continuous support from the IAEP Advisory Board in the form of time and advice from practitioners on course content and teaching methods / our exposure to seminars presented by the Department for Education Innovation at UP / our teaching philosophy which focuses on competency development and "learning by doing". We reflect regularly on our teaching practices to ensure that we achieve the required learning outcomes and "produce" competent individuals; and our mindset towards continuous improvement of amongst others, teaching practices; The need for developing the business communication competencies of internal auditors at tertiary level has been identified by the IAEP Advisory Board of the University of Pretoria in 2006. The IAEP Advisory Board suggested the introduction of a business communication course at postgraduate level for internal auditing students. A task force consisting of academia and internal audit practitioners was established to investigate the structure and content of such a business communication course. This led to the introduction of the BKM 780 semester course in 2007 exclusively developed for the BCom (Hons) in Internal Auditing learners.
- The management of the Department of Library services and the Department of Information Science; I want to customize library orientation for the NET generation. My research proves that majority of first year students are experienced game players and only a small percentage were non experienced game players. The non-experienced players in the test group amounts to 267 compared to the experience game players of 1005. Oblinger (2004) suggest that 77% of elementary students are regular game players and 60% of high school students are regular game players. Information overload is a hurdle for many students. Defining and helping students to find the right information at the right time could improve their chances to succeed.
- I want to be the best I can be at what I do, and assist the students as well as I can – if I did not, what was the point of this career? I am therefore not interested in innovating for the sake of innovating (an unfortunate side-effect of the awards are that some people do apply pressure to 'innovate' by using technology etc. – even if it comes at the cost of quality of teaching; while I am very much in favor of technology, I think the most important thing is to use the most appropriate teaching methods / aids / techniques, rather than just using something different so that you can say you 'innovated'.) As stated above, most of what I do seems obvious to me and the challenge is to fight the status quo as well as the 'check-box' mentality and get people to recognize the importance of the question: "What are we trying to achieve here?". Unfortunately, the answer often seems to be to do as little as possible, not rock the boat, and do what 'has worked for hundreds of years", or otherwise say – they say we should innovate so do something new (with no analysis of whether 'new' with no purpose is damaging). In other words, people don't want to do new things when they should, and want to do new things when they should not. ; As above, it seemed intuitively obvious. I guess I often also ask myself "what subject do I wish I had as a student?" and then I try to create that subject.
- Personal dissatisfaction with the content and structure as well as the fact that the teaching was all classroom-based (therefore not contextualized for learning about health systems) and poorly attended. Secondly the module was not meeting the learning needs of the target audience - highly intelligent senior medical students who are critical and whose opinions are valued. ; Exposure to academic service-learning while doing the PGCHE.
- Recognition for effort; More responsibility (refer to no 6) / New module, games and exhibitions of student work
- My realization that our society is in flux still grappling with tragic racist history. My experience in Germany provided ideological roots. I tried to in sue my students with self-assertion: by contextualizing material in own language and culture attempted to show them this by no means inferior to English
- The decision of RSA Government to cancel Latin as pre-requisite for Law and The Department of Education in South Africa who stopped Latin in Secondary Schools for financial reasons.; Because of the poor English proficiency on elementary, secondary and tertiary level, I personally initiated and was co-author of "Forward to the Past" based on a communicative approach and aims at proving writing, speaking, reading and listening skills. The lessons allow individual activities and group activities. The level of the programme depends on learners' command of English.
- Oversight over years. Control over own own subject. Do not have authority - award gave authority. Difficult to influence (small sphere of influence). To address risks - steals a lot of energy / those that do not innovate. Issues are not extrapolated to the population. Nature of occupation does not influence, rather dependent on your brain. Barrier: focus on 1% students 20/80 principle
- Mcom Tax Education. Wanted to get involved in teaching from young age - father did not want it. No educational training. Stopped PGCHE. Want to do PHD in tax education. Space to excel - education was interest from young age. Wants to become T and L Dean; Learn from experts - brown bag lunches, stimulates creative thinking. Univ priority courses gives

enough opportunity; likes to learn - platform to learn in your own hands. Need to have a plan and make time for important things - will make it a priority. If not promoted, it's OK. Culture of UP - people don't want to build a career, come from career in industry. Compare corporate. ; No guidelines, not enforced, communicated. Univ pays less, came as favor, spend time on making money. Money not an incentive for Theresa. How higher the post level outside UP, the more difficult. Stay at UP because of a more balanced life. Non-performance is not regulated in UP (no consequences); Tax curriculum - VAT in second year.

<p>Identify and interpret the critical enablers and barriers to innovation adoption</p>	<p><u>Barriers to innovation adoption:</u></p> <ul style="list-style-type: none"> • Unrealistic expectations top-down approach • the challenge is to fight the status quo as well as the 'check-box' mentality and get people to recognize the importance of the question: "What are we trying to achieve here?". • More support from the Head of Department and Faculty. Mentorship and encouragement are essential factors. More guidance and info on the structures and regulations • In order to truly be innovative in education, it is at times necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. • Workload • I don't feel universities value innovation enough. There is more emphasis on research and post-graduate studies than innovation on under-graduate level. To me the two areas are inter-changeable • I was initially allowed to implement ideas I had (even though I had to take the criticism and 'flak' if something didn't work perfectly, but had to share all the credit if things did work). <p><u>Enablers to innovation adoption:</u></p> <ul style="list-style-type: none"> • Time-table • Our students have limited exposure to 'real' life marketing challenges and we wanted to create a simulation of reality and that ignited a new teaching model • I was appointed as the course coordinator • Extended pgm (ENGAGE) • External stakeholders / Alumni / Advisory board • Experience • Curriculum review • Conferences / training courses • In order to truly be innovative in education, it is at times necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. • I felt the course was not effective, classes very big and the skills not addressed • Workload • Technology – e.g. game based learning • The chalk and talk way of teaching struck me as inefficient, often ineffective, boring, frustrating and frankly useless, especially in a world where students are learning at an incredible speed, given more stimulating, relevant and connecting learning / teaching methods. • service-learning teaching and learning strategy • Experiences – Teaching 10 years at Vista University gave me insight in the community and student population • Due to a curriculum update and the renewed focus on aligning our curriculum with industry demands • Inefficient literacy courses • Experiences • Grounding - passion for education - leads to trying to create the best experience. Students are clients.
<ul style="list-style-type: none"> • Unrealistic expectations top-down approach • I want to be the best I can be at what I do and assist the students as well as I can – if I did not, what was the point of this career? I am therefore not interested in innovating for the sake of innovating (an unfortunate side-effect of the awards are that 	

some people do apply pressure to 'innovate' by using technology etc – even if it comes at the cost of quality of teaching; while I am very much in favor of technology, I think the most important thing is to use the most appropriate teaching methods / aids / techniques, rather than just using something different so that you can say you 'innovated'.) As stated above, most of what I do seems obvious to me and the challenge is to fight the status quo as well as the 'check-box' mentality and get people to recognize the importance of the question: "What are we trying to achieve here?" Unfortunately, the answer often seems to be to do as little as possible, not rock the boat, and do what 'has worked for hundreds of years", or otherwise say – they say we should innovate so do something new (with no analysis of whether 'new' with no purpose is damaging). In other words, people don't want to do new things when they should, and want to do new things when they should not. ; As above, it seemed intuitively obvious. I guess I often also ask myself "what subject do I wish I had as a student?" and then I try to create that subject.

- More support from the Head of Department and Faculty. Mentorship and encouragement are essential factors. More guidance and info on the structures and regulations
- Modern day students: 7:30 poor class attendance, lack of interest, students found it strange, hard to understand, boring.
- Our students have limited exposure to 'real' life marketing challenges and we wanted to create a simulation of reality and that ignited a new teaching model. We therefore incorporated client-based as well as in-class challenges for students to interact with the knowledge they have about the subject but in the same sense develop managerial skills necessary in industry.
- I was appointed as the course coordinator of BHP500 and wanted to make a very significant contribution that could change the way that we teach certain aspects.

I attended some conferences where criticism was often heard from the rural veterinarians that the Faculty was not stimulating the interest of students in rural practice, and I tried to design a project that would address this deficiency.

The details of how the project works are available in the attachments. Basically it is a reality-simulation of a small scale beef feedlot, all the way from the purchase of the weaner calves, through the feeding and care of the animals to the carcass and the marketing thereof. It gives students very good insight into the business behind animal production units in general, as well as the important role that they as veterinarians will play in food security.

- I talk to industry partners and old students regularly and realized that the industry has changed dramatically the last 10 years. The industry is fast paced, changes constantly and is also dispersed. Globalisation and the nature of retailing (supply chain) forces companies to operate in different countries simultaneously. This necessitates interface and collaboration over organizational and geographical boundaries between workers. Also retailers are looking for students that are skilled, have product knowledge and can handle the pace and work under pressure. I am constantly looking for opportunities and ways to create /incorporate the nature of the clothing and textile industry with the courses I teach and enhance students' learning. Professional and personal development of students is very important to me. I want our students to be in demand and proud of their degree
- The 5yp (five-year programme) that was offered by UP from 1994 to 2009 did not provide significant results in terms of student success and throughput as well as retention. So it was decided, when money became available in a Foundation grant, to explore and implement a new Augmented model – the Engage programme.
- In order to truly be innovative in education, it is at times necessary to break away from the conventional - while at the same time keeping the best interest of students in mind. The TEARS approach aims to put a career and research focus on education. TEARS was applied to the FLG211 and FLG324 modules where the theory was restructured to be more career orientated and altered to CEatUP programs [namely Neuroscience: Sports Vision training and Testing (FLG211); Higher and Online Advanced Certificate in Exercise Science (FLG324)]. Education (lectures, practicums and assignments) was presented in an interactive manner to encourage student participation and enhance learning. The career orientated theory was applied by involving students in community projects where they participated in the fitness, wellness and sports vision testing at several Investec International Academy training sites and three gyms established for rural communities in Soweto, Germiston and Protea, all under the supervision of postgraduate students. The data that was obtained from the testing was then used by the students under the guidance of postgraduate students for research, degree and publication purposes. The TEARS principal satisfied the requirements for education innovation in the way of education, careers, research and community services.
- Due to a curriculum update and the renewed focus on aligning our curriculum with industry demands we realized we need to better equip students to join the workforce. Thus, our innovation of team-based real life challenges/problems to emulate the workplace.
- Experiences – Teaching 10 years at Vista University gave me insight in the community and student population. It is also because of my background at Vista that I was not scared to start working in communities. My decision was further influenced by the fact that I arrived at UP, received no study guide or guidance on the module (JTK 200) and had to design my own module. Education Innovation assisted here and I was able to come up with strategies to address the outcomes of the module.
- However, after two years (2004-2006), I felt the course was not effective, classes very big and the skills not addressed. I attended several courses at Education Innovation, which assisted me as well as the guidance of Education Innovation specialist. I need to mention, however, that she was an outstanding specialist and I have not been able to find the same support again within the Faculty itself.
 - The innovations I have implemented are all aimed at reducing my workload and shifting the responsibility for learning back to the students. These innovations include:
 - Implementing the department's prescribed referencing style in the "Citations and Bibliography" function in MS Word 2010 as well as in Zotero freeware citation manager.
 - Developing "DocChecker" software that allows students to scan their documents for compliance with the department's technical care requirements.
 - Using a process of peer evaluation where students evaluate and comment on one another's draft research proposals before these documents are evaluated by the students' supervisors.
- The need expressed by the Internal Audit Educational Partnership (IAEP) Advisory Board to produce internal audit graduates who have excellent communication skills contributed significantly to the decision to innovate. We realized that we have to change at least the postgraduate programme to include a hands-on practical business communication course. An Advisory Board, consisting of representatives of the IIA (SA), public practice, commerce and industry and government, has been established within the Department of Auditing to oversee the programme and to support the University's continuing efforts to provide excellence. The Advisory Board complies with, amongst other things, the following prescriptions of the IIA Inc., which entails that the Advisory Board must:
- Game based learning – to keep up with new developments in Education. Horizon report 2012 predict and explosion in game based learning in the future

<ul style="list-style-type: none"> • In short – the chalk and talk way of teaching struck me as inefficient, often ineffective, boring, frustrating and frankly useless, especially in a world where students are learning at an incredible speed, given more stimulating, relevant and connecting learning / teaching methods. • I was personally dissatisfied with the structure and content of our contribution and brought this to the attention of the person from SHSPH who was our coordinator. • In 2007 I attended the PGCHE with Prof Blitz from Family Medicine (who at that time was the overall module coordinator) and at the end of the programme we had decided to try to use a service-learning teaching and learning strategy to bring about the change in the module as the module had declined steadily over the intervening years and was at that time the worst rated module in the entire medical curriculum. By this point in time I had gained more control over the SHSPH contribution and could effect change • Realized classical philology not contextualized in SA. Saw dire need of offering student support to indigenous students. Saw lack continuity EOT and other courses • Conference: American Classical League (ACL) = Schola Scripta (SS). Research: University of Georgia, Athens, Atlanta = Medical Terminology (MTL) RSA Government cancel Latin as pre-requisite for Law in 1996 = Legal Latin (RTL) • Leader at school. Grounding - passion for education - leads to trying to create the best experience. Students are clients. Leader on the field, keynote speaker. Want to be the best, want to win, give my best. Do it to the best of my ability. 	
<p>How does absorptive capacity of the relevant individual affect the outcomes in terms of innovative performance:</p> <ul style="list-style-type: none"> • For instance, are certain disciplines more conducive to innovation than others? • Are some types of work experience more important than others e.g. work experience achieved in the same sector compared to work experience achieved in other sectors? 	<ul style="list-style-type: none"> • 4 years of experience as lecturer, no formal training in higher education • Radio, film, television and stage acting and radio and television presenting. • .We obtained full support from our department to experiment with this teaching model and allowed a lot of freedom in terms of what we wanted to include in our courses. No training but it should also translate in some research output, well at least in my mind that is the only additional way one could create an output in terms of the current focus of research at our university • I received no training directly linked to this project. I did however attend a short course in ClickUP and I did a diploma in tertiary education; Phd in Higher Education, Academic development and support – Factors influencing academic achievement with university students; I am trained as an Educational psychologist and have worked as a student counsellor for 13 years before joining UP in 2005. • As an increased student capacity calls for innovative educational approaches to be implemented in order to meet the increased demand and diversity • PhD (Marketing); Support from department to experiment but no training. • I seek the guidance of the Department of Community Engagement • MCom Marketing Management; I have received no formal training to support these innovations. Where necessary, I have trained myself. • Receive an amount of R30 000 as seed funds from the Dept. of Education Innovation • BCom (Honours) Accounting; MPhil (Workplace Ethics); Certified Internal Auditor (CIA) accredited by the professional Institute of Internal Auditors (IIA). • International peer: Visit to Dr Glenn Sumners.at Lousiana State University, USA to examine his teaching practices in internal auditing; • Training and background in Information Literacy training and informal training in Scotland; Supporting students and lecturers with information literacy training and general support. • No formal training; mostly my own thoughts, projections and I read a book many years ago called “The Learning Revolution”. I also, in 2003, did a De Bono Creativity course at the University as part of a test group. • Comfortable with not having to move out of their comfort zones (part of me still believes this). • Support for innovation – I was initially allowed to implement ideas I had • Contract worker and since achieved success in innovation was left out of normal structural routes to do my own thing. • Diploma Higher Education (US), Research Nation at Risk; University of Virginia (UVA). As Director of Academia Latina, Department of Ancient Languages, I experiment with different programmes to illustrate and prove the motto of the centre: “Vivit Lingua Latina” • Mcom Tax Education. Wanted to get involved in teaching from young age it. No educational training. Stopped PGCHE. Want to do PHD in tax

	<p>education. Space to excel - education was interest from young age. Learn from experts - brown bag lunches, stimulates creative thinking. Univ priority courses gives enough opportunity; likes to learn - platform to learn in your own hands. Need to have a plan and make time for important things - will make it a priority.</p>
	<ul style="list-style-type: none"> • D Phil. Radio, film, television and stage acting and radio and television presenting. • PhD Industrial Marketing Management. No training but had full support from Department and lots of freedom to include what we want in course. We obtained full support from our department to experiment with this teaching model and allowed a lot of freedom in terms of what we wanted to include in our courses. No training. Teaching on undergraduate as well as postgraduate level is part of a Senior lecturer's job but it should also translate in some research output, well at least in my mind that is the only additional way one could create an output in terms of the current focus of research at our university. I also believe that this is part of community service as it is helping the students to get exposure to a number of different industries and challenges as well. • BVSc, MSc (Vet Sci). When project started: 4 years of experience as lecturer, no formal training in higher education. Full support from HOD and financial backing from Department (project had financial risk). Pharmaceutical and feedlot industry - financial and expertise support for project. Support from colleagues - project now self-supporting; At the time when the innovation was started, I was a lecturer with 4 years' experience in higher education, but no formal training in higher education as such. • B. Home Econ: General, Hon. Cons Sci: Clothing, Diploma: Tertiary Education, M Cons Sci: Clothing Retail Management; I received no training directly linked to this project. I did however attend a short course in ClickUP and I did a diploma in tertiary education; I was only recently appointed (July 2012) in a fulltime permanent lecturer position. For 13 years I was a part-time lecturer. I don't feel universities value innovation enough. There is more emphasis on research and post-graduate studies than innovation on under-graduate level. To me the two areas are inter-changeable. Quality undergraduate courses set the stage for quality post-graduate research. If students are not exposed to innovative ways of learning and functioning they will not be able to implement it in their workplace or post-graduate studies. • Phd in Higher Education, Academic development and support – Factors influencing academic achievement with university students; I am trained as an Educational psychologist and have worked as a student counsellor for 13 years before joining UP in 2005. Initially I was appointed on contract at the Unit for Academic Literacy and presented various academic literacy modules before joining Professional Orientation in the Engage programme in 2010; I am a senior lecturer in Professional orientation focusing on academic and life skills as well as academic reading and writing. In my experience students are getting weaker in terms of their reading and writing ability, hence the need for this kind of developmental work and programmes is growing. • PsychoPhysiology, PhD (Physiology), Higher and Advanced Certificates in Exercise Science, Certificates in Neurosciences and Sportmanagement; Support from CEatUP and Education Innovation; The higher education structure is required to constantly evolve in order to keep pace with the shifting economy. Dobbins (2009) highlights the fact that the economy has advanced to a point where it is largely based on knowledge and its transfer hereof. This has called for an increased output of young adults with high level skills who are able to positively contribute to economic growth. However, it is important to consider that in order to achieve an increased yield of knowledgeable students, the amount and range of individuals accepted at universities has to be altered accordingly. This has presented a challenge of its own - as an increased student capacity calls for innovative educational approaches to be implemented in order to meet the increased demand and diversity. • PhD (Marketing); Support from department to experiment but no training; My job description it to teaching under and postgrads and to conduct research as well as community service • P Hd. – nie seker wat bedoel met field of expertise?; I attended the CE@UP course on Community Engagement offered by Gerda Bender in 2006, which helped me to start the community engagement initiative. Further support from Education Innovation (Carol Gossman) and ClickUp support (Jacky Rammappuda). Support received from DIA for financial initiatives. • Permission granted to start the project by my Head of Dept and Dean. However, when I was warned by Dr Bender that I could not just do such innovations, I seek the guidance of the Department of Community Engagement, and specifically Gernia van Niekerk, and later Denver Hendricks. Had it not been for their support and guidance over the years, I would most definitely not have continued with these endeavours; I found that I needed to think out of the box to keep the students interested and to try to enhance their learning experiences. Merely lectures proved to be boring and uninspiring. Lecturers need to stay abreast of new ideas, or at least keep up. • MCom Marketing Management; I have received no formal training to support these innovations. Where necessary, I have trained myself. I did, however, receive an amount of R30 000 as seed funds from the Dept. of Education Innovation for the development of the "DocChecker" software; I have been teaching at the University of Pretoria since 2001. In this time, I have taught courses at both an undergraduate and postgraduate level and have also supervised Honours and Master's students. • BCom (Honours) Accounting; MPhil (Workplace Ethics); Certified Internal Auditor (CIA) accredited by the professional Institute of Internal Auditors (IIA). Field of expertise: Internal auditing; Business and Professional Ethics; Course responsible lecturer: Jana Slippers: PhD in Communication Management. Field of expertise: Business communication / (IAEP) Advisory Board (see above) / IIA global and IIA (SA) – the professional bodies globally and in South Africa support UP's internal audit programmes and accredited UP with Centre for Internal Auditing Excellence - status. The UP's programme is one of only five registered programmes in the world. In order to be classified as a Centre of Excellence, institutions must adhere to specific requirements, amongst others, an IAEP coordinator, a formal education and training programme, and as a quality assurance mechanism, an Advisory Board. This status supports the recognition of the internal audit programme as international best practice in internal audit education and motivates innovative ways of teaching practice. Training received from: UP's Department for Education Innovation providing seminars various seminars throughout the year on teaching and learning practices and assessment methods, International peer: Visit to Dr Glenn Summers at Louisiana State University, USA to examine his teaching practices in internal auditing; My experiences in Higher Education are in the areas of teaching, research and community service as follows: Teaching: Lecturer in Financial Accounting at University of Pretoria (UP) (4 years) / Senior lecturer in Internal Auditing at UP (10 years) / Guest lecturer in Business and Professional Ethics at UP (5 years) Research: Completed MPhil in Faculty of Humanities and currently registered for a PhD in Internal Auditing (Faculty of Economic and Management Sciences) / Published 6 articles in accredited international and national academic journals during the past 4 years / Completed MPhil in Faculty of Humanities and currently registered for a PhD in Internal Auditing. Community Service: Presenting several short courses in financial accounting, internal auditing and ethics to employees in the

<p>public and private sectors / Serving as member of the Education and Training Committee of the Institute of Internal Auditors (SA) / Developing course material and assessments for outcomes-based education and training programmes.</p> <ul style="list-style-type: none"> • Hons. Information Science busy with Masters in Information Science; The Department of Library Services are very open to innovation and support and allow me to develop a game for library orientation. Training and background in Information Literacy training and informal training in Scotland; Supporting students and lecturers with information literacy training and general support. • Bcom, LLB, LLM, working on LLD, advanced certificates in labor law and alternative dispute resolution. Highest field of expertise would be clinical legal education and law; No formal training; mostly my own thoughts, projections and I read a book many years ago called "The Learning Revolution". I also, in 2003, did a De Bono Creativity course at the University as part of a test group. By and large, though, it have to say most of the innovations seemed intuitively obvious to me and I was very surprised that they weren't to everyone else as well – I just assumed people were too • Comfortable with not having to move out of their comfort zones (part of me still believes this). Support for innovation – I was initially allowed to implement ideas I had (even though I had to take the criticism and 'flak' if something didn't work perfectly, but had to share all the credit if things did work). Other than allowing me some space to do it, and some very basic support (initially), I found; I don't have a proper job description yet, so I can't answer. • BCur; MPH; PGCHE, Highest expertise? Not sure what you mean...but let's say public health and within that broad category it is health systems.; Only what we had learnt about community engagement from Dr Gerder Bender in the PGCHE. The rest was peer support between Prof Blitz and myself; Sorry this question is too broad. What experiences do you mean? Beyond this innovation/module? • PHD. M(Opv) - contributed to innovation. Implementation of the learning area technology in primary school in Gauteng and Free State provinces. Support - Ina Joubert - motivate, gave previous example of application, followed guideline. Training - No EI assistance. Ronel Callaghan assisted with HELTASA application; Kollege 9 years, University 11 years • D Litt et Phil. Greek Tragedy and Philosophy Zulu izibongo; 4 years doing doctorate in German seminar; Contract worker and since achieved success in innovation was left out of normal structural routes to do my own thing. • B.A. SOD Stellenbosch. Latin III, Diploma Higher Education (US), Research Nation at Risk; University of Virginia (UVA). As Director of Academia Latina, Department of Ancient Languages, I experiment with different programmes to illustrate and prove the motto of the centre: "Vivit Lingua Latina" • Mcom Tax Education. Wanted to get involved in teaching from young age - father did not want it. No educational training. Stopped PGCHE. Want to do PHD in tax education. Space to excel - education was interest from young age. Wants to become T and L Dean; Learn from experts - brown bag lunches, stimulates creative thinking. Univ priority courses gives enough opportunity; likes to learn - platform to learn in your own hands. Need to have a plan and make time for important things - will make it a priority. If not promoted, it's OK. Culture of UP - people don't want to build a career, come from career in industry. Compare corporate. ; No guidelines, not enforced, communicated. Univ pays less, came as favor, spend time on making money. Money not an incentive for Theresa. How higher the post level outside UP, the more difficult. Stay at UP because of a more balanced life. Non-performance is not regulated in UP (no consequences); Tax curriculum - VAT in second year. 	
<p>Explore polarities between the institutional intent to adopt innovation and the economic alignment of the higher education sector with SA's human resource needs.</p>	<ul style="list-style-type: none"> • Allowed – no support • Fight the system • Find own funding • No in collaboration • Very demotivating for staff. It means extra work, less publication time, and less promotion opportunities.
<p>Although my head of Dept allowed me to start the initiative, I did not receive support initially. On the contrary, I had to fight the system and find my own funding. Eventually, as the project became more successful, I had the support of management. Colleagues were never really interested in collaboration, and I think this can be very demotivating for staff. It means extra work, less publication time, and less promotion opportunities.</p>	

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