

**AN ACTION LEARNING APPROACH TO  
ENTREPRENEURIAL CREATIVITY,  
INNOVATION AND OPPORTUNITY FINDING**

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# SUMMARY

## AN ACTION LEARNING APPROACH TO ENTREPRENEURIAL CREATIVITY, INNOVATION AND OPPORTUNITY FINDING

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A generally accepted definition of an entrepreneur is an individual with the ability to realize a specific vision from virtually anything, a definite human creative action. A differentiating factor defining the true entrepreneur is represented by the entrepreneurial skills: creativity and innovation. The fundamental skill to "create", therefore generate an idea and transforming it into a viable growth-oriented business, forms an unconditional and integrated necessity in entrepreneurship training programs. Many researchers in this field emphasize the need for and the lack of training models regarding this intervention.

Courses offered by training institutions focus on training the traditional manager and not the entrepreneur. A lack of skills training for growth-oriented business is also evident. A critical deficiency in models directly addressing the Creativity, Innovation and Opportunity finding issues, as part of entrepreneurship training, creates a situation of minuscule

differentiation between a business idea and an opportunity, in a training context. It is furthermore apparent that a lack of tools, textbooks and approaches to cultivate creativity exist in the field. The latter generates stifling pedagogical paradigms in teaching business and entrepreneurship.

This study demonstrates a new action learning approach and model, developed to increase creative and innovative behavior and actions of the entrepreneurship learner. Three purposive samples were used, on the basis of an experimental design. Ratio data was obtained by means of a reliable measuring instrument (Chronbach's alpha on an acceptable level). ANOVA as well as a Discriminant analysis indicated statistical significant differences between the different groups.

This study illustrates that the proposed training methodology that was used enhance the level of creativity and innovation of the entrepreneurship learner on this program. Recommendations regarding future research in this exiting field of study are addressed.

# OPSOMMING

## 'N AKSIELEER-BENADERING TOT ENTREPRENEURIESE KREATIWITEIT, INNOVASIE EN GELEENTHEIDSIDENTIFISERING

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'n Algemeen aanvaarde definisie vir die entrepreneur is 'n individu wat oor die vermoë beskik om 'n spesifieke visie uit bykans enige iets te laat realiseer. Hierdie is 'n menslik kreatiewe aksie. Die entrepreneuriese vaardighede: kreatiwiteit en innovasie is egter faktore wat die werklike entrepreneur onderskei. Die grondliggende vaardigheid om te "skep", 'n idee te genereer en omvorm tot 'n lewensvatbare groei-georiënteerde onderneming, vorm 'n integrale deel van entrepreneurskapopleidingsprogramme. Die behoefte en gebrek aan opleidingsmodelle in die verband word deur verskeie navorsers bestempel as belangrik.

Die meerderheid opleidingskursusse fokus op opleiding van die tradisionele bestuurder en nie op entrepreneurskapsopleiding nie. Daar bestaan ook 'n algemene tekortkoming aan vaardigheidsontwikkeling vir die bestuur van 'n groeiende onderneming. 'n Kritiese leemte is verder

waarneembaar in terme van opleidingsmodelle wat Kreatiwiteit, Innovasie en Geleentheidsidentifisering direk aanspreek. Hierdie verskynsel het tot gevolg dat daar min tot geen onderskeid tussen die idee en 'n geleentheid, in 'n opleidingskonteks, getref word nie. Weinig instrumente, handboeke en benaderings wat kreatiwiteit kataliseer word waargeneem. Die voorafgaande problematiek veroorsaak dat uitgediende pedagogiese denkrame in die opleiding van sakebestuur en entrepreneurskap ontstaan.

Hierdie studie poog daarin om 'n nuwe aksieleer-benadering en model te ontwikkel, ten einde kreatiewe en innoverende gedrag en optrede by die entrepreneurskapleerder te vestig. Die studie beskik oor 'n eksperimentele ontwerp, waartydens drie doelbewuste steekproewe onderneem is. Vergelykende data is deur middel van 'n betroubare meetinstrument ingesamel (Cronbach Alpha op 'n aanvaarbare vlak). ANOVA ("Analise van Variansie") asook 'n Diskriminantontleding dui op statisties betekenisvolle verskille wat bestaan tussen die groepe.

Dié studie dui daarop dat die opleidingsmetodologie wat toegepas is wel die kreatiwiteits- en innovasievlakke van die entrepreneurskapleerder verhoog. Voorstelle word gemaak aangaande toekomstige navorsing in dié veld.

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## Chapter 1: Background and orientation of the problem

### 1.1 Introduction

*In spite of the impressive proliferation of the entrepreneurial education and training courses in the 1980s and 1990s, little is known about the performance, effectiveness of this training or the extent to which it really matches the needs of target groups. Empirical research in this area remains the exception. Without a stringent feedback about the usefulness of the education programs, the contents and methods of courses stay to be “gospel” more than theoretically based teaching.*

(Klandt 1993:13)

The Republic of South Africa, which forms the geographic scope of this study, has shown positive growth in respect of its economic environment after the demise of the apartheid era. It is, however, evident that certain critical economic and social aspects and indicators have not been addressed to the full. The World Competitiveness Report (2003) placed South Africa in the 18<sup>th</sup> position out of the measured 30 developed and newly industrialised countries in the world. Although the country still offers certain positive conditions (lowest living cost for employees, lowest electricity costs for businesses and relatively low income tax levels), it ranks of lowest in terms of the unemployment rate; short life expectancy; the level of economic literacy; the general skills level of employees; foreign direct investment, infrastructure and foreign exchange reserves.

Unemployment tends to be one of the major concerns with regards to economic growth. Van Tonder (2003:8) indicates that the economic growth of this country should be elevated to a towering 7.7% till the year 2014, in order to lower the extreme current unemployment rate of 29% to an acceptable level of 11%. The current unemployment rate implies

that approximately 13.5 million individuals are part of the economic active population of the country.

A high level of entrepreneurial activity in any country has the propensity to make a direct and positive impact on the elevation of unemployment and related concerns. Theodosiou (1996:19) argues that businesses with human resource relations of 1 to 19 (the so-called small business ventures) are already contributing about 47% of job creation in comparison to the 34% of the formal sector. It is also pointed out that about 10% of small business ventures are responsible for all new job opportunities that are created by the small business sector as a whole. These businesses are categorised within the “entrepreneurial sector” and it is this factor that differentiates them from other small business ventures.

Davidson et al. in Theodosiou (1996:19) point out that the development of new businesses plays a larger role in economic growth than the development of existing businesses. Supporting this fact, Radley (1996:37) argues that entrepreneurial activity is a prerequisite for the success of economic growth, development, social well-being and political stability. Mahadea (1994:42) adds that the “residual” hypothesis could play a part in the analysis of the varied economical growth in countries. Hereby it is understood that the influence of labour, capital and the residual element has a significant impact on economic growth. Entrepreneurship is seen as an essential element of the residual. Schumpeter, as quoted by Mahadea (1994:43), substantiates this statement as early as 1934 by regarding entrepreneurship as the primal driving force behind any economic development.

Kuratko and Hodgetts (1998:10) conclude by pointing out that both the economic and social influence of entrepreneurs has by far the largest



impact on job creation, innovation and economic renewal compared to the formal sectors worldwide.

This study differentiates between “entrepreneurship” and “small business management” and will be elaborated upon in Chapter 2. For the purpose of the study the entrepreneur as such is therefore defined as follows:

An entrepreneur would be an individual with the ability to realise a specific vision from virtually anything – a definite human creative action. A differentiating factor defining the true entrepreneur is represented by the entrepreneurial skills of creativity and innovation. The fundamental skill to "create" thus generating an idea, and the action of transforming it into a viable growth-oriented business forms an unconditional and integrated necessity in entrepreneurship training programmes. (*Own formulation.*)

The field of entrepreneurship in South Africa has certain unique although limiting characteristics. These traits contribute directly to the current symptoms, regarded as negative in the sense of economic development and growth of the country. Consequently, entrepreneurship in South Africa does not hold a strong position and, in fact, is generally approached with some degree of contempt.

*The Global Entrepreneurship Monitor (GEM)* is an executive report conducted annually in order to assess the current state of entrepreneurship in a specific country compared to the rest of the world. The 2002 report includes a comparison of 37 participating countries. The South African ranking constitutes the following results:

- South Africa is ranked in the 19<sup>th</sup> position in overall entrepreneurial activity with 6.54% of the adult population involved in an entrepreneurial venture established since January 1999. It is the lowest rating of all the so-called developing countries participating in the study (including Thailand, India, Chile, Argentina, Brazil, Mexico and South Africa).
- It holds the 15<sup>th</sup> position in start-up activity (a start-up is a business that has not paid salaries and wages for longer than three months), with just under 5% of the adult population involved in the start-up process.
- It is rated 29<sup>th</sup> in new firm activity (a new firm is a business that has paid salaries and wages for longer than three months, but less than 42 months), with only 2% of the adult population involved in this phase.
- South Africa holds the 9<sup>th</sup> position in necessity entrepreneurship (a necessity entrepreneur is involved in a new business because he/she has no other choice of work), with 2.38% of the adult population being necessity entrepreneurs.
- It is rated 29<sup>th</sup> in opportunity entrepreneurship (an opportunity entrepreneur is involved in a new business in order to pursue an opportunity), where 3.3% of the adult population are involved in pursuing exploitable opportunities.
- With regard to all measurement of entrepreneurship South Africa ranks lowest of all developing countries.
- Finally, in respect of opportunity entrepreneurship and new firm activity, South Africa is ranked in the lowest quartile of all the countries measured.

It is thus quite a negative scenario that arises concerning the role entrepreneurship has to play in South Africa. The relative importance

of entrepreneurship is, however, assessed as being of the utmost importance.

The following table compares South Africa's Total Entrepreneurial Activity (TEA) with the rest of the world (SA's figure of 6.54% means that approximately six out of every 100 adults of the population are entrepreneurs). "Entrepreneurial activity" implies that an individual is involved in starting a business.

**Table 1: South Africa's TEA in relation to the rest of the world**

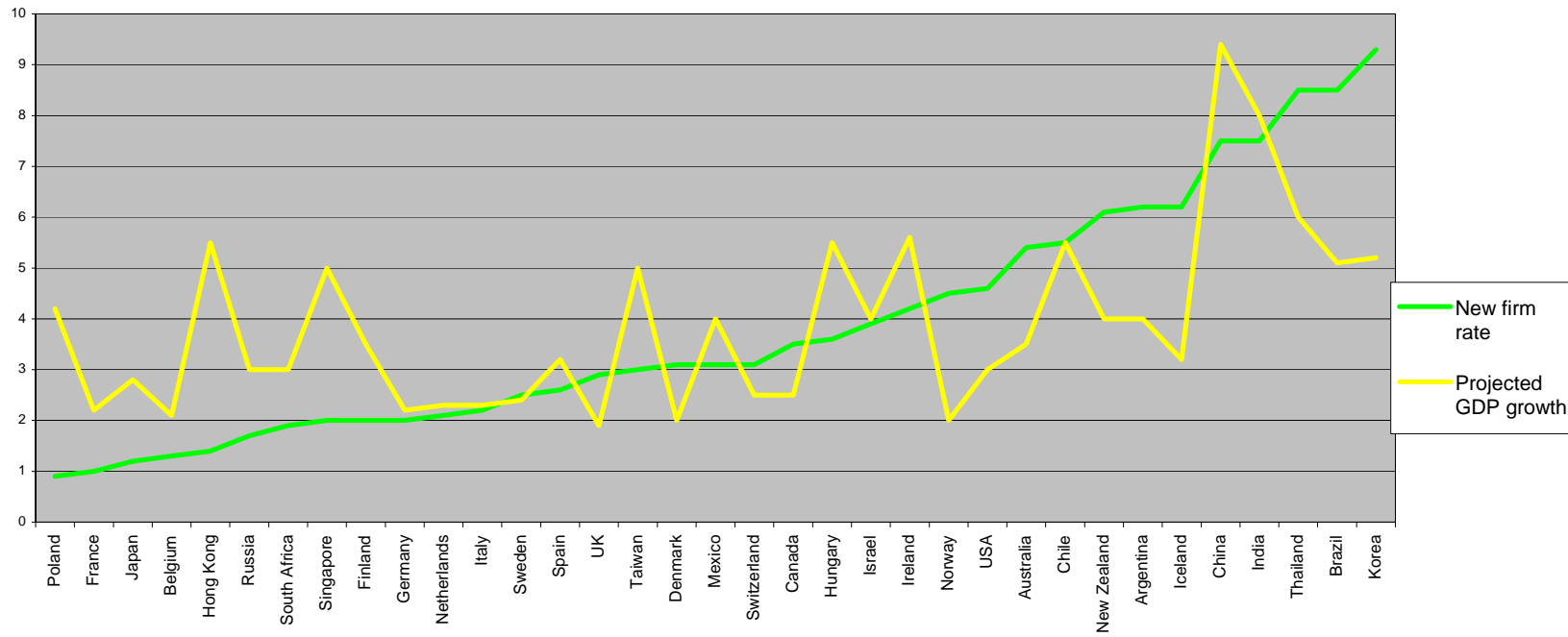
Country	TEA 2002	Necessity rate	Opportunity rate	Start-up rate	New firm rate	TEA 2001
1. THAILAND	18.9	3.35	15.31	11.63	8.4	n.a.
2. INDIA	17.88	5.04	12.42	10.89	7.45	11.55
3. CHILE	15.68	6.74	8.53	10.4	5.49	n.a.
4. KOREA	14.52	4.12	8.55	5.85	9.29	14.89
5. ARGENTINA	14.15	7.13	6.77	8.52	6.2	11.11
6. NEW ZEALAND	14.01	2.25	11.57	9.13	6.06	18.07
7. BRAZIL	13.53	7.5	5.78	5.69	8.46	12.74
8. MEXICO	12.4	2.7	8.28	9.18	3.22	20.73
9. CHINA	12.34	6.97	5.61	5.54	7.41	n.a.
10. ICELAND	11.32	0.92	8.62	5.65	6.23	n.a.
11. USA	10.51	1.15	9.11	7.09	4.57	11.61
12. IRELAND	9.14	1.38	7.77	5.66	4.2	12.23
13. CANADA	8.82	1.1	7.36	5.94	3.58	10.98
14. NORWAY	8.69	0.37	7.42	5.23	4.4	8.78
15. AUSTRALIA	8.68	1.53	6.69	3.76	5.22	15.5
16. SWITZERLAND	7.13	0.87	6.03	4.44	3.26	n.a.
17. ISRAEL	7.06	1.4	5.22	3.36	3.88	5.67
18. HUNGARY	6.64	2.11	4.0	3.49	3.62	11.43
19. SOUTH AFRICA	<b>6.54</b>	<b>2.38</b>	<b>3.3</b>	<b>4.71</b>	<b>2.0</b>	<b>9.45</b>
20. DENMARK	6.53	0.43	5.9	3.63	3.12	8.01
21. SINGAPORE	5.91	0.86	4.94	4.03	2.03	6.58
22. ITALY	5.9	0.53	3.34	3.74	2.35	10.16

<b>23. UK</b>	5.37	0.69	4.38	2.49	3.05	7.8
<b>24. GERMANY</b>	5.16	1.15	3.92	3.51	2.07	7.99
<b>25. SLOVENIA</b>	4.63	1.37	3.26	3.28	1.53	n.a.
<b>26. NETHERLANDS</b>	4.62	0.5	4.03	2.57	2.09	6.44
<b>27. SPAIN</b>	4.59	1.02	3.42	2.24	2.54	8.17
<b>28. FINLAND</b>	4.56	0.33	3.88	2.68	2.06	7.66
<b>29. POLAND</b>	4.44	1.27	2.84	3.67	0.77	9.97
<b>30. TAIWAN</b>	4.27	0.71	3.33	1.28	3.08	n.a.
<b>31. SWEDEN</b>	4	0.67	3.33	1.8	2.51	6.68
<b>32. CROATIA</b>	3.62	0.85	2.18	2.81	0.94	n.a.
<b>33. HONG KONG</b>	3.44	1.19	2.25	2.04	1.4	n.a.
<b>34. FRANCE</b>	3.2	0.09	2.84	2.4	0.86	7.37
<b>35. BELGIUM</b>	2.99	0.27	1.99	2.13	1.08	4.54
<b>36. RUSSIA</b>	2.52	0.56	1.9	1.09	1.54	6.93
<b>37. JAPAN</b>	1.81	0.51	1.24	0.87	1.04	5.19

(Source: Adapted from GEM (2002:10))

Entrepreneurship, as argued before, is meant to be an indicator for economic growth. The following figure correlates the entrepreneurial activity with lagged indicators of economic growth. Economic growth has been estimated, based on the projected figures for 2003-2004.

Figure 1: International comparison of new firm rates and forecast economic growth for 2003 - 2004



(Source: Adapted from GEM (2002:17))

Figure 1 shows that start-up and new firm rates correlates positively with projected economic growth.

It is furthermore meaningful to specify the gender and racial distribution of entrepreneurship in South Africa.

- **Gender**

Entrepreneurial activity among men is much higher than women. Men are twice more likely to be new firm entrepreneurs than women and one and a half times more likely to be owner-managers of an established business. Female entrepreneurs employ on average 1.7 people while males employ 3.5.

- **Race**

The following tables reflect the racial distribution of entrepreneurial activity in South Africa:

**Table 2: Start-ups**

<b>Racial classification</b>	<b>Percentage of population</b>
Coloured	5%
Indian	4.5%
Black	3.8%
White	3.8%

**Table 3: New firms**

<b>Racial classification</b>	<b>Percentage of population</b>
Coloured	3%
Indian	0.9%
Black	1.1%
White	3.6%

**Table 4: Established firms**

<b>Racial classification</b>	<b>Percentage of population</b>
Coloured	0.9%
Indian	3.2%
Black	2%
White	6.5%

South Africa’s historical course shows that the above distribution of racial groups, relating to entrepreneurial activity, has not changed radically over time. The developmental gap between Previously Disadvantaged Individuals (PDIs) and the rest is, however, rather phenomenal and needs specific attention.

It is essential to note that the informal sector currently “employs” more than three million small business owners. This sector is also the primary location of black entrepreneurs. The entrepreneurs located here is faced with circumstances that greatly hamper growth. The table below shows the main obstacles experienced by entrepreneurs in both the formal and informal sector in South Africa:

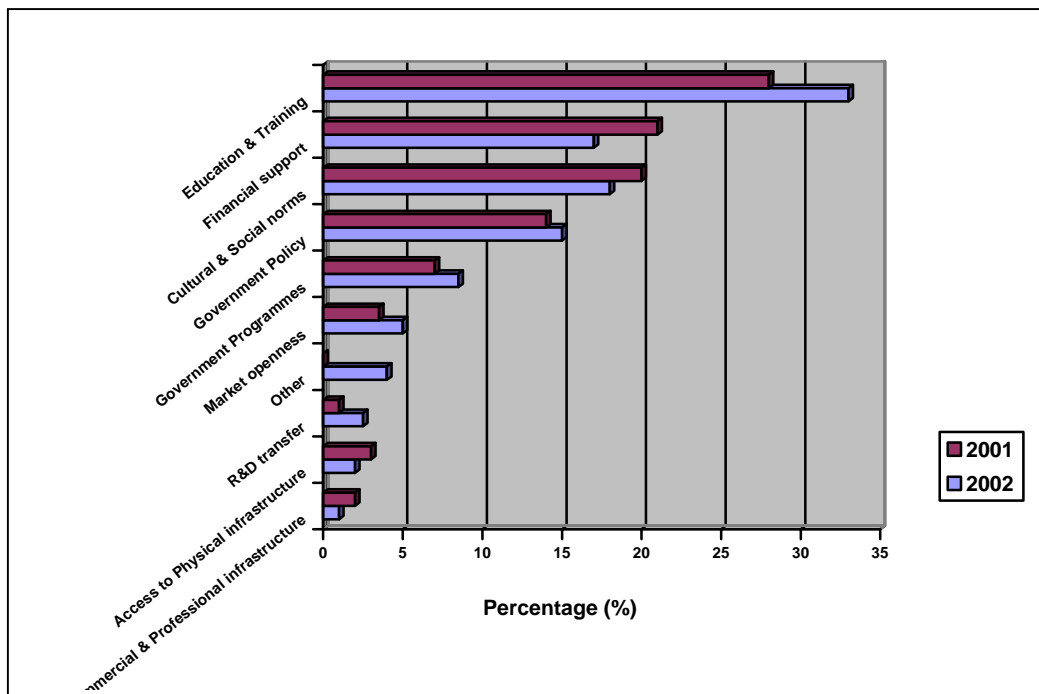
**Table 5: Main obstacles experienced by entrepreneurs**

	Formal	Informal
Lack of money for running costs	39%	65%
Lack of money to buy capital items	45%	63%
Transport	41%	50%
Weather	35%	43%
Competition	41%	40%
Theft	39%	32%
Unavailability of electricity	20%	34%
Lack of business skills	27%	33%
Unavailability of water	16%	31%

(Source: Adapted from GEM (2002:32))

One of the main problem areas in the field is the role of education and training in the generation of entrepreneurial activity. The GEM report provides unquestionable evidence regarding the importance of entrepreneurship education and training, which is reflected in Figure 2.

**Figure 2: The role of entrepreneurship education and training**



(Source: Adapted from GEM (2002:46))



Notwithstanding the general need for education and training in the field, critical issues surround the phenomenon on a global level (with specific reference to the content of entrepreneurship programmes).

Garavan and O' Cinneide (1994:3-12) believe that the field lacks a generally accepted paradigm or theory regarding the contents of entrepreneurship education and training. They refer to the following researchers in substantiation of their opinion: Sexton & Bowman (1984); McMullan & Long (1988); Hills (1989) and Vesper (1990). Reid (1987) elaborates on the issue when he states that current literature on entrepreneurship education and training only touches the surface as far as the design of content is concerned. Attention is mainly focused on one aspect of a total training programme.

The above arguments are supported by this study when an attempt is made to formalise the problem in terms of real problem areas and shortcomings (as derived from entrepreneurship research literature).

## **1.2 Problem statement**

The introductory part of this chapter highlighted the general problems and issues pertaining to entrepreneurship in South Africa and also the education and training of entrepreneurs. This statement outlines the background problem of the study.

The analysis of secondary data, as conducted by Antonites and Van Vuuren (2002), indicates a fundamental difference between the applications of certain or preferable concepts in a training context. The average as calculated from the compilation of the results of 13 concepts, is 49%. This might pertain to 49% consensus regarding the *compilation of content* or can enlighten individual constructs that could, to a lesser

extent, be applied as content. This in itself illustrates the fragmentary and insubstantial nature of entrepreneurship research (as supported by Cooper et al. 1994; Low & MacMillan 1988; Storey 1994; Wiklund, Davidson, Delmar & Aronson 1997 in Dahlqvist, Davidsson & Wiklund 1999).

A differentiating trait of the entrepreneur is the existence of the following entrepreneurial skills: Creativity, innovation and opportunity finding (also known as CIO). These concepts form the primary focus of the study (within an entrepreneurship training context), based on the findings of Antonites and Van Vuuren (2002). Their study indicated the fundamental importance of these skills. A figure of 74% showed that creativity, innovation and opportunity finding are included in entrepreneurship programmes, as assessed. The content of these concepts, as included in training programmes, has however not been agreed upon.

Carrier (1999:27) supports this fact by mentioning the following problem areas in the field:

- The lack of models addressing the creativity, innovation and opportunity finding issues directly, as part of entrepreneurship training.
- A lack of proper differentiation between a business idea and an opportunity, in a training context.
- Less emphasis on the pre-entrepreneurial phase of actively seeking business opportunities.
- A total lack of tools, textbooks and approaches to cultivate CIO (creativity, innovation and opportunity finding).
- CIO-stifling pedagogical paradigms in teaching business and entrepreneurship.

The specific research problem of this study is the lack of a focused approach in the training and development of the entrepreneurial skills: Creativity, innovation and opportunity finding.

### **1.3 Research objectives**

The study endeavors to prove that the content of a Creativity, Innovation and Opportunity finding training model (CIO), within an entrepreneurial context, will contribute to the development of new products, services and or processes and their likely commercial success. The problem of “content” with regards to entrepreneurial skills training is addressed, as is the contribution of the content accompanied by an action learning training methodology.

This study thus illustrates the training methodology that is used to enhance the level of creativity and innovation of the entrepreneurship learner, as part of the BCom degree with specialization in Entrepreneurship at the University of Pretoria, South Africa. This module forms part of the  $E/P = M (E/S \times B/S)$  training model (*The Entrepreneurship training model*) as applied in this programme.

A body of secondary research with regards to entrepreneurship training; creativity, innovation and opportunity finding; as well as the content and methodology used in the CIO training will be provided.

### **1.4 Propositions**

Cooper & Emory (1995) defined propositions as “a statement about concepts that may be judged as true or false if it refers to observable phenomena”. The following propositions will be tested by means of the empirical study:

**Proposition 1:**

*Experimental group 1 (treated) will show significantly higher scores on the likely commercial success of innovations, than the Control group.*

**Proposition 2:**

*Experimental group 2 (treated) will show significantly higher scores on the likely commercial success of innovations, than the Control group.*

**Proposition 3:**

*Experimental group 1 (treated) and Experimental group 2 (treated) will show significantly higher scores on the likely commercial success of innovations, than the Control group.*

**Proposition 4:**

*Experimental group 1 (treated) will show significantly higher scores on the likely commercial success of innovations, than Experimental group 2 (treated).*

**Proposition 5:**

*No significant differences exist between the Experimental groups and Control group with regards to the likely commercial success of innovations.*

## 1.5 Demarcation, scope and limitations of the study

### 1.5.1 Demarcation and scope of the study

The study was concerned with the assessment of the likely success of a creativity, innovation and opportunity finding training intervention, within an entrepreneurship training context. The CIO training model (Creativity, Innovation and Opportunity finding) was applied to the second year of *Baccalaureus Commercii* (BCom) degree specialising in Entrepreneurship, at the University of Pretoria, South Africa. The timeframe ranges from 1999 to 2002. An action learning approach was applied within an experiential learning context. Consequently, the action learning set is defined as being applicable to second-year entrepreneurship learners. The training model forms part of a programme that focuses on the acquisition of entrepreneurial and business skills. The following table displays the curriculum content of the entrepreneurship training programme:

**Table 6: The Entrepreneurship training model**

Entrepreneurial Performance (E/P)	Performance motivation (M)	Entrepreneurial skills (E/S)	Business skills (B/S)
▪ Establishment of own business	▪ Performance motivation	▪ Risk propensity	▪ General management skills
▪ Completion of first transactions		▪ Creativity and Innovation	▪ Marketing skills
▪ Growth in net value of business		▪ Opportunity identification	▪ Legal skills
▪ Recruitment of employees		▪ Role models	▪ Operational skills
▪ Increasing productivity levels			▪ Human resource management skills
▪ Increasing profitability			▪ Communication skills
			▪ Business plan

(Source: Adapted from Antonites (2000:21))

The above content will be described in greater detail by means of the literature review. The study's primary objective is to test the effect of the training intervention with conceptually a new product, service or process as outcome. Creativity, innovation and opportunity creates the platform for inducing the latter.

### **1.5.2 Limitations of the study**

A major limitation in this study is the novel nature of the field of entrepreneurship and likewise the content of training models in this context. The training of entrepreneurs in South Africa is still in a developmental phase. Little consensus on the content of training programmes exists. Out of an international perspective it has to be taken into consideration that the science of entrepreneurship is new with obvious limits in terms of available research.

The existence of literature and or practical examples with regards to creativity, innovation and opportunity finding in an entrepreneurial context is even more confined. In a number of cases the bibliographical evidence mentions the importance of these concepts, but only a few of these indicate the curriculum content, training methodology and the success rate of learning outcomes and or training models. This study is therefore pioneering in respect of of the application and testing of these entrepreneurial skills.

### **1.6 Importance and benefits of study**

The novel nature and short history of entrepreneurship creates a need for developing the science to the full. A critical and inducing element in the development of entrepreneurs in South Africa is based on the education and training of the potential and the existing. Various studies

address the need for training in this field, but a lack of consensus-based-content development is still present. This study firstly provides guidance to the *entrepreneurship trainer/academic* with regards to:

- The content of an entrepreneurial skills training model (Creativity, innovation and opportunity finding).
- A unique training process, methodology and parameters.
- The distinctive outcomes of implementing such a training model.

The second beneficiary in this study is the *entrepreneurship learner*, in respect of whom the following benefits are realised:

- A higher level of creativity is achieved as an outcome.
- A unique flexible and action learning approach is applied that facilitates the foregoing.
- New products, services or processes are developed (conceptually) with a higher level of likely commercial success in the market place. The potential entrepreneur therefore already creates a potential business concept with a future entrepreneurial career opportunity to exploit.
- The goal of true entrepreneurship is achieved.

The third beneficiary is the *economic environment of South Africa*, in respect of which the benefits are achieved by means of:

- A contribution to new product development that will enhance economic growth and international competitiveness.
- Potentially limiting the growth of the unemployment rate.
- The development of potential entrepreneurs as future business leaders in the South African and international field of business.

## 1.7 Research design

The following framework served as the basis of the research design:

### 1.7.1 Experimental design

The study consists out of two basic components as part of the research methodology. The first part constitutes the compilation of secondary data or a literature review, while the second consists of an empirical component.

The empirical method is embedded in an experimental design. Zickmund (1997:307) defines the experimental design as one that exists as a method based on the manipulation of a variable with the sequential testing of causal relationships among variables.

The experimental design consists of an independent variable that serves as the manipulated entity. The experimental design of the study involves the treatment or the independent variable as the CIO training model with an experimental group (entrepreneurship learners) and a control group (business learners not specialising in entrepreneurship).

The *Innovator* © (see Addendum), a measurement instrument that tests the likely success of new products, services or processes, serves as the dependent variable or criteria for judgement. Williams (1999) developed the questionnaire. The test units are firstly the learners specialising in entrepreneurship and secondly learners not specialising in entrepreneurship but in general business studies.

The treatment (independent variable) was conducted in a controlled research environment (non-laboratory), therefore striving towards a



“constancy of conditions”. Extraneous variables were limited as far as possible but interference was present. The main interference was non-class attendance, whereby some learners missed out on the process approach as part of the action learning paradigm applied in this programme.

### **1.7.2 Internal validity**

Zickmund (1997:308) categorises six different types of extraneous variables that may influence internal validity negatively: History, maturation, testing, instrumentation, selection and mortality. Internal validity may, to a limited extent, be affected due to the unknown background or experience (history) of the learners (in both cases: treated and control groups). The experimental treatment (training programme) can therefore not be seen as the sole cause of observed changes in the dependent variable. The age distribution of learners ranged between 19 to 22 years and can to a great extent be generalised as limited business experience. Hence it provides relatively high evidence of internal validity.

### **1.7.3 External validity**

The measurement instrument (*Innovator* ©) has been developed on the basis of the needs of the external business environment. It therefore measures the likely commercial success of new products, services or processes (innovations) in the market place. The external validity of the results tends to be positive, while research results can be generalised to the external environment.

#### 1.7.4 Classification of experimental design

This study is based on the Campbell and Stanley symbolisation, in which:

**X = exposure of a group to an experimental treatment**

**O = observation or measurement of the dependent variable.**

The classification of this study is a “**static group design**”. A static group design implies that an “after-only” design is present. The treated group is measured after treatment (the CIO training programme) took place and the control group is measured without a treatment intervention (the CIO training programme). The experimental symbolisation can be illustrated as follows:

<b>Experimental group:</b>	<b>X</b>	<b>O<sub>1</sub></b>
<b>Control group:</b>		<b>O<sub>2</sub></b>
Where the effect of the experimental treatment equals $O_2 - O_1$		

#### 1.8 Programme of investigation

The investigation started with a broad to specific literature review. The literature review explains the nature of entrepreneurship training and also provides an elaboration on the concepts of creativity, innovation and opportunity finding. A discussion on the content and learning methodology of the CIO training model, that was practiced and tested, follows. The third section refers to the research methodology applied

and the fourth presents a summary of findings, a conclusion and recommendation.

### **Chapter one: Background and orientation of the problem**

The first chapter offers a background to the focus of the study within a South African context. The following analogy is followed: The South African economy; The role of entrepreneurship in economic growth; Defining the entrepreneur (briefly); The state of entrepreneurship in South Africa; Entrepreneurship education and training in South Africa (briefly); The focus on creativity, innovation and opportunity finding. The problem statement is followed by the research question, definition of terms, demarcation, scope and limitation of the study.

### **Chapter two: Entrepreneurship training**

This chapter gives a broad spectrum of existing literature concerning entrepreneurship training. It starts with a background discussion on the training of entrepreneurs *per se*. The entrepreneur is then conceptualised and defined to provide a proper orientation towards the field of study. An indication of research in the field of entrepreneurship is presented, followed by an in-depth contribution on the training of entrepreneurs.

The section on “the training in entrepreneurship” is supported by a literature review which combines entrepreneurship as a subject and the entrepreneurship training model. The final outcome of any entrepreneurship training programme, namely entrepreneurial performance, is discussed, accompanied by a brief explanation of performance motivation and the following entrepreneurial skills: Creativity, innovation, opportunity finding, risk propensity and role

models. The content of business skills training (B/S) is excluded in the literature review but inclusive to the total entrepreneurship training model as applied in practice.

### **Chapter three: The concepts: Creativity, innovation and opportunity finding**

Chapter three narrows the literature review to the primary focus of this study, namely creativity, innovation and opportunity finding. The core facilitator that induces the final outcome of the training model is creativity. Special reference is made to the theoretical nature of creativity and this is structured as follows: Historical background of creativity; Obstacles in creative theory; Creativity defined, based on the 4Ps model of creativity (person, process, press and product); The creative process; Barriers to creativity and the Myths to creativity. The concept of innovation is then discussed as being the result of creative thinking and action, followed by Opportunity finding. The concluding part of the chapter describes Training in creativity, innovation and opportunity finding in an entrepreneurial context, to provide a fitting introduction to the next chapter.

### **Chapter four: The Creativity, innovation and opportunity finding training model (CIO training model)**

The fourth chapter contains the literature review and practical implications, and is divided into the following topics: Background to the development of the training model and the methodological framework of the model with regards to action learning in an experiential learning context. The chapter endeavours to exhibit the content of the CIO training model as well as the different phases integrated in the application thereof.

**Chapter five: Research procedures and methodology**

The research methodology, as aligned with the research design, is explained. The chapter describes the decision on samples and the measurement instrument applied (*Innovator* ©). The last section of the chapter elaborates on the theory behind the research methodology as represented in the research process.

**Chapter six: Analysis and discussion of results**

This chapter reflect an in depth analysis of the data obtained in this study. The first section explains the demographic profile of the respondent groups. The formation of certain factors on which the control group and experimental groups are compared is indicated in the second part. This subsection also includes the reliability of each factor. A third subsection compares the experimental groups with the control group, on these factors.

**Chapter seven: Summary and recommendations**

Chapter 7 portrays confirmation on the results both based on literature and empiric information. The significant differences among the groups are discussed and the propositions are likewise accepted or rejected. The final part of the chapter provides recommendations on primarily future research in this field, where the CIO training model may serve as a fundamental platform.

## **1.9 Conclusion**

Many researchers in this field emphasise the need for and the lack of training models involving entrepreneurship. This study demonstrates a new action learning approach and model, developed to increase creative and innovative behaviour and the actions of the entrepreneurship learner.

The need for entrepreneurship training in South Africa is a given fact upon which any further elaboration is unnecessary. Although unique in a fundamental sense, it is still evident that the pedagogical paradigms regarding CIO (Creativity, Innovation and Opportunity finding) also lack new approaches and successful outcomes.

The juvenile nature of entrepreneurship as an applied science leads to a total absence of general consensus on issues such as research methods, concepts, data or generally accepted modes of behaviour (especially in a training context). We are therefore dealing with a situation where a unilateral method within the science should be formalised and academic consensus obtained. The study at hand is indeed an attempt to contribute to such consensus.

## Chapter 2: Entrepreneurship training

*In evolution – nothing fails like success. A creature which has become perfectly adapted to its environment, an animal whose whole capacity and vital force is concentrated and expanded in succeeding here and now, has nothing over with which to respond to any radical change. Age by age, it becomes more perfectly economical in the way its entire resources meet exactly its current customary opportunities. In the end it can do all that is necessary to survive without any conscious striving or unadapted movement. It can, therefore, beat all competitors in the specific field; but equally, should the field change, it must become extinct.*

Arnold Toynbee

### 2.1 Introduction

The background to this study is based on the situational circumstances of the current South African business environment. The fundamental aspects within the framework are regarded as entrepreneurial education and training *per se* with specific reference to creativity, innovation and opportunity identification as entrepreneurial skills. The importance of entrepreneurship and the accompanying training of entrepreneurs are not only supported by the current socio-economic situation in South Africa, but are also catalysed by it. Chapter 1 emphasised the role of entrepreneurship as an economic driving force. Consequently emphasis is placed on the fundamental difference between entrepreneurship and small business management in this study. Watson (1994:43) quotes Carland et al. (1984) in an effort to indicate the radical conceptual difference between entrepreneurship and small business management. The author empirically proves that the difference between the two concepts is situated within innovative behaviour and the cognitive style of entrepreneurs versus small business managers or owners.

Begley and Boyd (1987:99) support this statement with further empirical evidence by proving that eight different personality and business characteristics could be differentiated between entrepreneurs and small business managers. Entrepreneurial ventures also show a marginally higher financial growth figure and have more effective competitive strategies in place. Brockhaus, as quoted by Watson (1994:42), doesn't regard this statement as one based on total consensus and this creates room for further research. For the sake of this research intervention it is, however, accepted that a difference exists between entrepreneurship and small business management with regard to emphasis on the training of entrepreneurs as such.

This study is supported by the increasing value of entrepreneurship as an economic phenomenon as well as the need for entrepreneurial research in general with the main focus on the education of creativity, innovation and the identification of opportunities as part of entrepreneurship training as a whole.

The entrepreneurial trainer can be regarded as one of the favoured parties in this study. This party provides the scientific basis for the compilation of entrepreneurial curricula and the processing of this in the training situation. Included here is the way in which the potential compilation of an entrepreneurial curriculum in terms of entrepreneurial skills (creativity, innovation and opportunity identification) could be construed flowing from the results of the implementation of this study; the entrepreneur – the potential increase of entrepreneurial performance and the participation in a comparative entrepreneurial development programme as compiled by and developed from the **E/P=f [M (E/SxB/S)** content model. The South African socio-economic environment, with the fundamental advantage of entrepreneurial training, namely job creation, and the potential decrease of the general unemployment situation, is the



other favoured party. This could possibly be analogously indicated along with the implementation of a suitable training model.

## **2.2 The Entrepreneur: Conceptualising and definition**

The historical development, processing and conceptualisation of entrepreneurship possibly started as early as the 1500s. Van Daalen (1989:16) categorises the conceptualising process of entrepreneurship as follows:

### **2.2.1 Entrepreneurs are seen as the flagships of complete uncertainty and risk**

Richard Cantillon (1755) is regarded as the first champion of this argument as he regards the entrepreneur as someone who has the ability, inclination and willingness to estimate a certain risk and take action accordingly. This risk could have profitability as a result. In this regard Cantillon is quoted as follows: “The entrepreneur buys at a certain price and sells at an uncertain price”. This argument is supported by similar arguments by Hawley (1892); Knight (1921); Von Mises (1949) and Schackle (1955).

### **2.2.2 The Entrepreneur as “true” innovator**

Schmöler (1880), as quoted by Van Daalen (1989:17), concluded with an analysis of economic behaviour indicating that the entrepreneur or *Unternehmer* must be seen as the core of all economic activity. The entrepreneur is furthermore regarded as a creative manager and organiser who is totally dependent of innovation and initiation. According to this, one can conclude that the entrepreneur combines production factors to produce new products and processes. Sombart, as quoted by

Hebert and Link in Van Daalen (1989:17), broadens this view by regarding the entrepreneur as a “new leader” as he/she urges the economic system on and strengthens it through creative innovation. Weber (1930) regards the entrepreneur as one who breaks free from the traditional production method and the development of new methods. Schumpeter (1939) is suitably quoted by Van Daalen (1989:22) here:

*...Development in our sense is a distinct phenomenon, entirely foreign to what may be observed in the circular flow of the tendency towards equilibrium. It is spontaneous and discontinuous change in the channels of flow, disturbance of equilibrium which forever alters and displaces the equilibrium state previously existing.*

One can thus conclude that even during this period of time innovation was regarded as one of the fundamental aspects of entrepreneurial behaviour.

### **2.2.3 The Entrepreneur as conveyor of uncertainty, certain abilities and innovation**

The arguments of Baudeau (1767); Bentham (1838); Von Thünen (1850) and Von Mangoldt (1855) are summarised by Cole (1946) in Van Daalen (1989:24). He places greater emphasis on the role of the entrepreneur as an individual motivated by profit. As a decision maker and risk taker a part of his/her main activities also include innovation and invention that goes hand in hand with the reduction of cost and the increase of profit:

*Entrepreneurship may be defined as the purposeful activity (including an integrated sequence of decisions) of an individual or group of associated individuals, undertaken to initiate, maintain or aggrandize a profit-orientated business unit for the production and/or distribution of economic goods and services with pecuniary or other advantages the goal or measure of success in interaction*

*with (or without the conditions established by) the internal situation of the unit itself or with the economic, political and social circumstances (institutions and practices) of a period which allows an appreciable measure of freedom of decision”.*

#### **2.2.4 Entrepreneurship in terms of perception and adaptation**

Clark (1892); Kirzner (1973) and Schultz (1975) support the above-mentioned statement by putting more and more emphasis on the human factor in the economic system. In this school of thought the impact of human actions were critical. Human actions, classified as entrepreneurship, are applied to establish certain adaptations in the market in order to acquire a kind of equilibrium. The implication is therefore that the entrepreneur must exhibit the ability to handle certain instabilities or so-called “disequilibria” in the market.

The contemporary composition and conceptual layout of an entrepreneur is regarded as a field of study all on its own. For the sake of this study, the definitions as derived from Cornwall and Perlman (1990:4), Van Praag (1996:3), Burch (1986:4), Mare (1996:3), Drucker (1985:25); Hisrich and Peters (1998:9), and Kuratko and Hodgets (1998:31) are used. According to these the entrepreneur is regarded as an individual with the potential to create a vision from virtually nothing. This is fundamentally a human creative action. Energy is invested in the initiation process by initiating the start up of a company rather than to merely analyse and be an onlooker in the process of forming a new business. This vision and action includes the willingness to take a calculated risk. This risk envelops personal, social, and psychological as well as financial components. Everything possible is done to achieve the goals (set by the individual him/herself) and avoid the possibility of failure. A noticeable attribute within this frame of reference is the fact that the entrepreneur has the ability to identify an opportunity where the

regular man on the street would see chaos, contradictions, ambivalence and confusion. The core of entrepreneurship can, however, be seen in the development of the “new”, be it products or services with corresponding adding of value and profit driven decision-making. The reward for achievement is not only financial, but also involves personal satisfaction and independence.

For the sake of this study, the continual aim is to regard concepts and constructs in accordance with generally accepted definitions. It is therefore not the aim to redefine the underlying constructs, but merely to apply them as constructs and concepts within the theoretical model  $[E/P=f [m (E/S \times B/S)]]$  as developed by Van Vuuren (1997:1).

### **2.3 Research within the field of Entrepreneurship**

According to Watson (1994:3) research into the field of entrepreneurship suffers greatly from a lack of a communal structure, framework and the generally accepted definitions of constructs. The general direction for the future of entrepreneurial research is seen as very much a fragmented one.

Boshoff and Van Vuuren (1992:372) divide the entrepreneurial theory and research in three main categories, firstly the entrepreneur and his/her actions and qualities; secondly, the entrepreneurial process; and thirdly, the factors involved in increasing the promotion of the development of entrepreneurs and entrepreneurial activity. In support of the importance of the research into the importance of entrepreneurial research (the third factor) Paulin et al. in Watson (1994:34) regard this subject as one of the mainstream research areas within entrepreneurship as such.

The study therefore fundamentally aims to undertake this problematic issue within entrepreneurial research scientifically as well as to point out the problem areas within entrepreneurial training by suggesting a new framework wherein training can take place.

#### **2.4 Training within the field of Entrepreneurship**

Entrepreneurial training and education acts as a facilitator for entrepreneurial activities with the main focus being to stimulate entrepreneurial activity and performance. This fact acts as a base to ensure that the research that is necessary and conducive in this field to ensure economic growth, is in fact conducted. Training within this perspective is supported by the work of Buckley and Caple (1991:17), where the training *per se* is defined as an intentional effort to teach specific abilities, which are knowledge bearing, to complete the project better.

Hirsowitz (1993:25) argues that training creates new opportunities and possibilities as well as a consciousness to attempt and complete certain tasks in a different way. The trainability of entrepreneurs is accepted as a given in this study and is supported by Gibb (1985:3), Hisrich and Peters (1998:19) Kuratko and Hodgetts (1998:10), Rosa and McAlpine (1992:64), Van Vuuren (1997:1) and Welsch (1993:14), as well as McClelland (1969:1).

Currently the problems of entrepreneurial training is seen in the lesser consensus that exists where the content of courses and curricula are involved. Loucks (1982:45) supports this statement by pointing out that there is a big gap where substantial standardised components within the entrepreneurial training programme exist. Rosa and McAlpine (1992:73) further point out that more emphasis within the training situation should

be placed on the complex and multi-disciplinary aspects of entrepreneurship. Those that are regarded as successful programmes vary between being exceptionally simplistic to being mostly abstract.

Dermin and Levin in Van Vuuren (1997:1) regard the current programmes as:

- an over-emphasis of theoretical & quantitative instruments;
- having too little relevant qualitative factors;
- placing too much emphasis on instruments, concepts and models;
- focusing on bureaucratic management only;
- placing too little emphasis on entrepreneurial activity; and
- having facilitators that concentrate more on virtual than on real problems.

Scott (1988:13) regards the approach of the current training system as being very pragmatic whilst Timmons (2000:49) suggests the following desirable circumstances: Active involvement in entrepreneurial activities, an understanding of the dynamic characteristics of the entrepreneurial environment and the introduction of the existing reality aspects to the practice situation.

Morris and Hooper (1996:14) strongly argue that no single theory is being developed as the “content estimator” of entrepreneurial training. Research in this field tends to be explorative and descriptive as well as “cross-sectioned” and more dependent on “posterior” statistical testing rather than “priori” hypothetical testing. Testing in general tends to be small and non-representative.

Van Vuuren’s (1997:1-15) aim in his pioneering work was to try and construe a supposed multiplicative contents model in an explorative way

for entrepreneurial training. The model consists of the following constructs: Entrepreneurial performance (E/P); performance motivation (M); entrepreneurial skills (E/S) and business skills (B/S). The composition of the constructs configures in a dynamic multiplication model:  $E/P = f [M(E/S \times B/S)]$

The primary aim of this study is based on this content model with specific reference to the following concepts or entrepreneurial skills: Creativity, innovation and the identification of opportunity as primary elements in the training process.

#### **2.4.1 Entrepreneurship as a subject**

Cooper, Hornaday and Vesper (1997:13) point out that from a historical perspective the first entrepreneurial programme was taught at the Harvard Business School as early as 1947.

Plaschka and Welsch (1990:102) regard entrepreneurship's existence and its right to exist as one that was characterised by a long struggle to develop an identity and acquire some recognition. The first hurdle was possibly the battle to differentiate between the differences existing between "entrepreneurship" and "small business management" as disciplines. The small business sector has been renowned for being a sector with a lack of growth and innovation as well as for the "mother" and "father" image. It was therefore difficult to ascertain a separate identity for entrepreneurship without stigmatising it as a part of the aforementioned. The authors point out that entrepreneurship was initially a part of general management subjects and later became a part of small business management. Vesper (1980:12) regards this phase (the pre-70s phase) as one where entrepreneurship accepted "borrowed" or "stolen" principles that didn't put the establishment of the identity at the

forefront. Plaschka and Welsch (1990:105) quote Vesper where he points out that entrepreneurship, as a subject, could be viewed as follows: "...entrepreneurship was a tangential activity, academically flaky, and lacking in a scholarly body of knowledge. Little research in entrepreneurship goes on and consequently the literature on it remains thin." The authors argue that the development of entrepreneurship as a discipline went through four fundamental phases before it could be acknowledged as an acceptable academic subject.

#### **2.4.1.1 Systematic theory development**

The consensus surrounding an acceptable definition with regards to the borders of entrepreneurship, the acceptance of the fact that entrepreneurs can be trained, the movement towards more sophisticated research methods and statistical techniques, a move towards the usage of bigger samples, the division and attention to entrepreneurship and intrapreneurship form part of the theory development. Wortman (1989), in Plaschka and Welsch (1990:110), on the other hand points out that very little uniformity exists in terms of the above-mentioned theoretical development.

#### **2.4.1.2 Authoritarian and professional organisations**

Formal disciplines are known for the support and existence of recognised representative professional organisations. The first representative organisation in this regard was "Recontress de St.Gall" in 1947. At present there exists about one similar entity in each state.



#### **2.4.1.3 A professional culture**

The entrepreneurial hero of the 1990s replaced the image of the “Robber baron of villains” of the 19th century. The value of entrepreneurship is currently recognised through concepts like creativity, innovation and opportunity development in a dynamic environment. As a result it is also formally accepted that entrepreneurial activity, the key to innovation, increased productivity and more effective competition in the market environment.

#### **2.4.1.4 Entrepreneurship as a career**

An acceptable pointer of the professionalism of a discipline is when its existence leads to a career or job opportunity. Sexton and Bowman (1984:93) add to this and is quoted as follows “...consequently, colleges and universities have recognised that starting and operating a business is a viable career alternative that deserves academic attention”

Mahlberg (1995:37) critically states that entrepreneurship as a discipline is one of the few subjects that pushes integration and the combination of functional knowledge and abilities to the limit. He further argues that the abilities and knowledge needed for the establishment of a business even differs from the ability and knowledge needed for the growth of the business. From this one can conclude that entrepreneurship should obviously follow a holistic approach.

It is important to notice that entrepreneurship as a process is as complex as any science. Gartner (1989:695) regards entrepreneurship as a non-continual, non-linear process known for its multi-disciplinary characteristics. Guedallo et al (1997:4) adds to this and regards the process as being unstable, holistic and even catastrophic “...rather it is

a disjointed, discontinuous, unique event no matter whether it is a mega or a macro venture”

Van Vuuren (1992:26) quotes Bygrave who compares science with physics. He points out that in the hierarchy of Sciences, Mathematics (as basic science) for instance would feature on top, with Sociology at the bottom. In this context entrepreneurship should be regarded as an applied science, rather than basic. He furthermore points out that with all the applied sciences, engineering would be on top with entrepreneurship right at the bottom. The multi-disciplinary characteristics of entrepreneurship are proven because some of the basic sciences (mathematics, physics, biology, psychology and sociology) as well as applied sciences (medical, economic and business management) show a degree of correspondence and are mostly contained within the field of entrepreneurship. Churchill (1998:39) points out that physics as a science already had its origin around 5 B.C. (Democritus and Plato). Entrepreneurship on the other hand originated in the 18<sup>th</sup> century (Smith era). Training in the aforementioned science reaches back more than 2000 years whilst training in entrepreneurship is only about 30 to 40 years old.

The newness of entrepreneurship as an applied science creates a situation wherein virtually no agreed method, concept, data or accepted practice (training context) exist. The opportunity presents itself therefore to formalise a simple method in science and this should be pushed towards academic consensus. This study aims to make a contribution in this regard.

#### 2.4.2 The Entrepreneurship training model

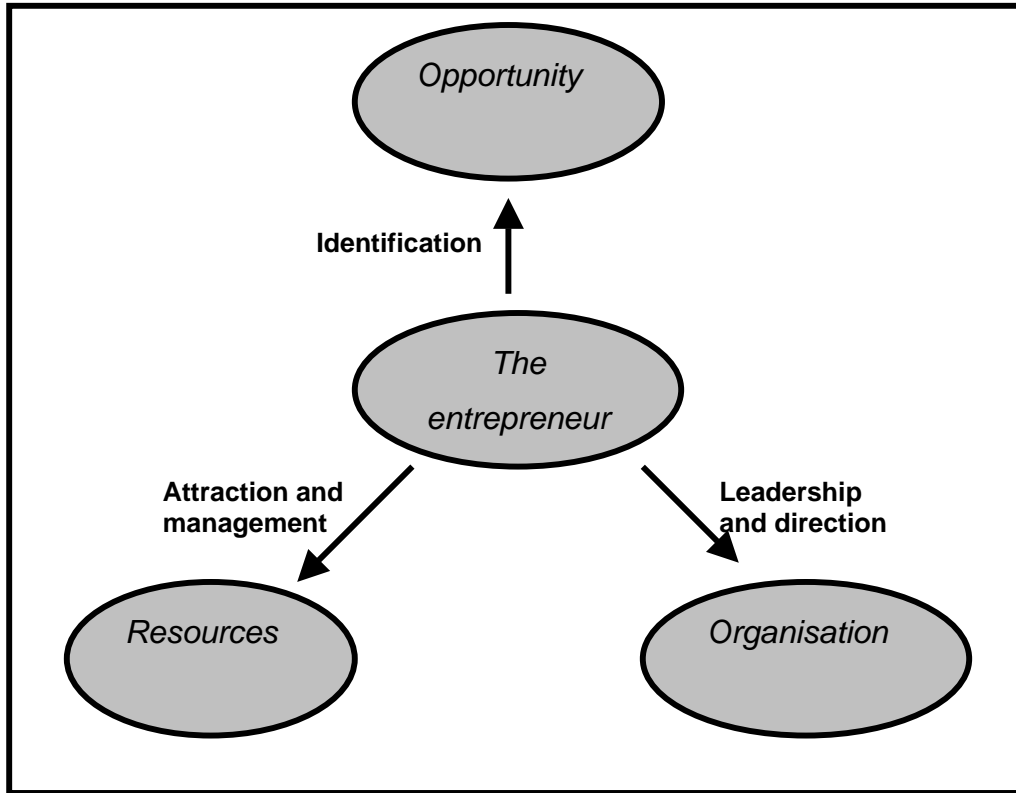
The suggested training model as compiled and applied by Van Vuuren (1997:3), was compiled from the following multiplication construct  $E/P = f [M (E/S \times B/S)]$ . The contents formula suggests that the construct **E/P** – entrepreneurial performance; **M** – performance motivation; **E/S** – entrepreneurial skills and **B/S** – business skills. One can conclude from this that the increase or decrease in entrepreneurial performance should be seen as the multiplication result of performance motivation (**M**); Entrepreneurial skills (**E/S**) and Business skills (**B/S**).

Van Vuuren, who is regarded as the technical developer of this model, uses the Motivational and Expectation Theory of Vroom (1964) as diversion instrument. Vroom's theory proves that achievement can be seen as multiplication function of **individual motivation (M)** and the **ability (V)** of the individual  $P = f (M \times V)$ . Abilities within this context are regarded as existing and acquired knowledge. Analogous to Vroom's model, Van Vuuren uses the construct "achievement" in the context of "entrepreneurial performance" as well as "business skills" that needs to be present in order to achieve or maintain a level of achievement.

Subsequently it is of the utmost importance to place the development of the model against the backdrop of the entrepreneurial process.

Firstly, the model of Wickham (2000:37), who explains the entrepreneurial process within a simplistic framework of value creation:

**Figure 3: The entrepreneurial process**



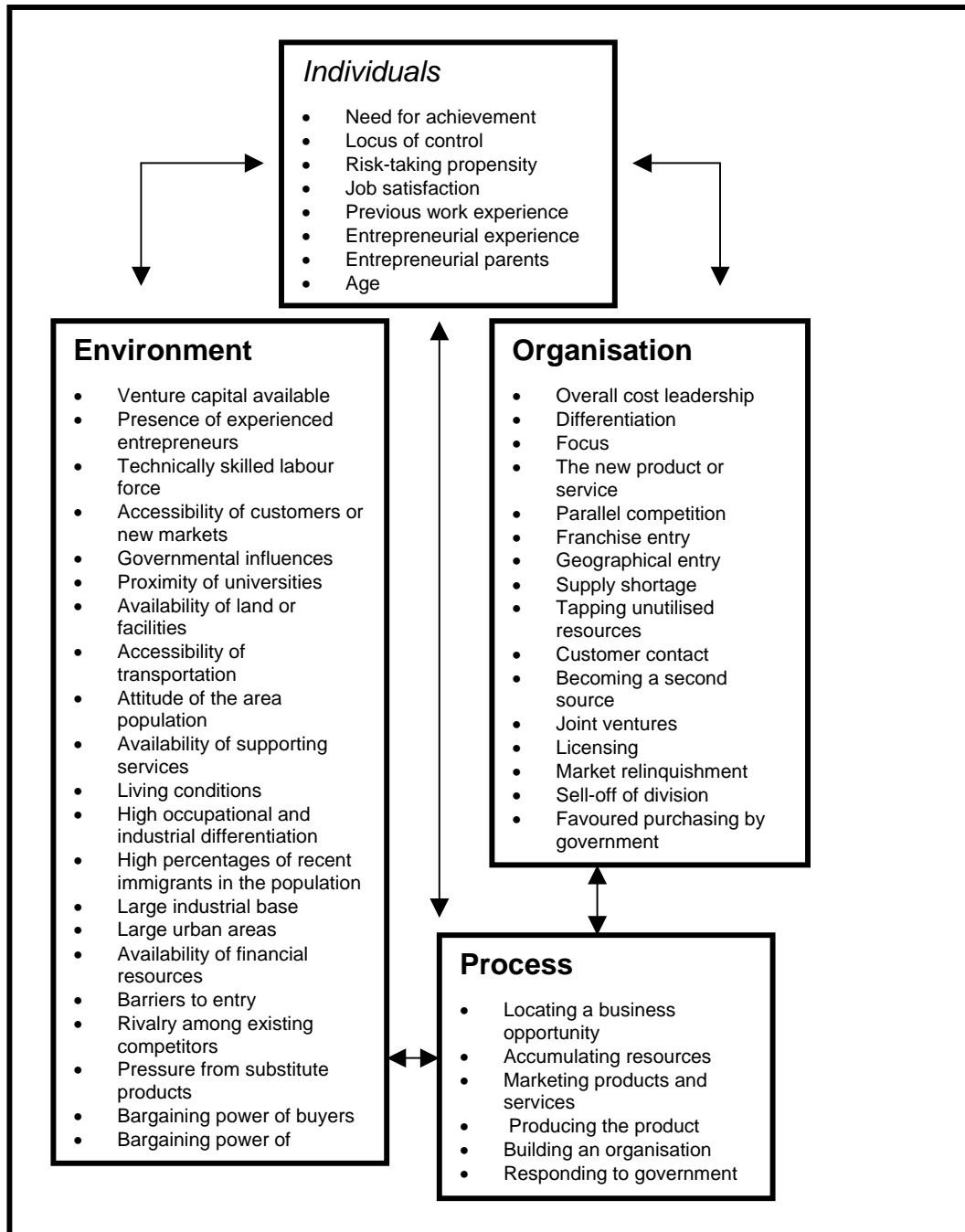
(Source: Adapted from Wickham 2000:37)

The entrepreneurial process, as indicated by Wickham, is based on four reciprocating contingencies. The entrepreneur forms the hub and core element in any entrepreneurial process. He or she (or entrepreneurial team) therefore needs certain characteristics and skills in order to explore feasible market opportunities. Wickham notes the significance of the entrepreneur in identifying and exploiting opportunities in the market in a differentiating manner. The latter elevates the importance of innovation as a differentiating entrepreneurial skill. An entrepreneurial organisation is therefore needed to produce the innovation and exploit the opportunity in the market place. Another differentiating skill (leadership) is needed to create an organisation which will grow and expand in an

entrepreneurial performance context. The entrepreneur is also responsible for attracting the necessary resources or factors of production to fulfil the expected need on the side of the organisation and to achieve set objectives.

Secondly, Gartner (1985) in Kuratko and Hodgetts (2001:44), broadens the model by placing more emphasis on the environmental variables that are role players in the development of the entrepreneurial business. The process model sees the individual (entrepreneur) as an element with specific traits (need for achievements, locus of control, risk-taking, job satisfaction, work experience, role models, age and education); the organisation (type of firm; entrepreneurial environment; partners; strategic variable – cost, differentiation and focus as well as competitive entry mechanisms); the process involved, as compared to the previous process, the business opportunity, resources, marketing of the products or services, the production of the product, organisational development and response to the institutional and societal impact. The environment, as such, forms a pivotal component of the process-model including the following variables: The role of venture capital; inclusion of experienced entrepreneurs – mentors; technical skilled labour force; accessibility of suppliers; access to customers and new markets; government influences; proximity of educational institutions; availability of land; transport; attitude of immediate population; access to support organisations and basic living conditions. The authors emphasise the interactivity of the model as a process approach as compared to the classical “segmented school of thought”. They present the process as follows:

**Figure 4: Variables in the development of the entrepreneurial business**



The role of entrepreneurial training as intervention in the successful achievement of objectives or the desired increase in entrepreneurial performance is a vital part of the entrepreneurial process (Timmons

1999:40), and with this it is meant that the training programme is a fundamental support function in this process. The trainability of entrepreneurs is already accepted as a given in the previously mentioned parts. Training programs in general are also based on the entrepreneurial process.

The contents of the suggested training model, namely  $E/P = f \{M (E/S \times B/S)\}$ , is formulated as a synthesis of the above-mentioned processes and could be schematically presented as follows:

**Table 7: The Entrepreneurship training model**

Entrepreneurial Performance (E/P)	Performance motivation (M)	Entrepreneurial skills (E/S)	Business skills (B/S)
<ul style="list-style-type: none"> <li>▪ Establishment of own business</li> </ul>	<ul style="list-style-type: none"> <li>▪ Performance motivation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk propensity</li> </ul>	<ul style="list-style-type: none"> <li>▪ General management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Completion of first transactions</li> </ul>		<ul style="list-style-type: none"> <li>▪ Creativity and Innovation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Marketing skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Growth in net value of business</li> </ul>		<ul style="list-style-type: none"> <li>▪ Opportunity identification</li> </ul>	<ul style="list-style-type: none"> <li>▪ Legal skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Recruitment of employees</li> </ul>		<ul style="list-style-type: none"> <li>▪ Role models</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operational skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing productivity levels</li> </ul>			<ul style="list-style-type: none"> <li>▪ Human resource management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing profitability</li> </ul>			<ul style="list-style-type: none"> <li>▪ Communication skills</li> </ul>
			<ul style="list-style-type: none"> <li>▪ Business plan</li> </ul>

(Source: Adapted from Antonites (2000:21))

As a result the various constructs of the model are discussed in short.

## **2.5 Entrepreneurial performance (E/P)**

Van Vuuren (1997:3) argues that the following variables should be regarded as entrepreneurial achievement or results with regard to the realising of set entrepreneurial goals: Firstly, an increase in productivity; secondly, the increase in the amount of employees employed, which implies the expansion of the business; thirdly, the net value of the business; fourthly, a core aspect in entrepreneurship, namely the increase in profitability; and finally, the completion of the first market-related transactions.

## **2.6 Motivation (M)**

Topical questions on what motivates the entrepreneurs have been in existence for a couple of years. What motivates an individual seen as an entrepreneur to totally commit him/herself to the establishment and development of a business? What motive is involved with the high inclination to take a personal risk in the process? Which motives distinguish the entrepreneur from the standard business person and what leads to the absolute striving towards independence versus the security of a set salary and employment?

It is generally accepted that certain personal qualities of the individual distinguish him/herself as entrepreneur or non-entrepreneur or as entrepreneur versus small businessperson. These qualities include an inclination towards risk, an internal locus of control, the way in which failure is accepted, drive, energy and so forth.

Gartner in Naffziger et al. (1994:29) argues that personal qualities are virtually totally applicable as generic qualities where the general



individual is involved, whom he describes as the “generic everyman”. Some of these qualities can therefore be present in anyone’s situation. Shaver and Scott, as quoted by Naffziger et al., rearrange this statement as follows:

*The study of new venture creation began with some reasonable assumptions about the psychological characteristics of “entrepreneurs”. Through the years, more and more of these personological characteristics have been discarded, debunked or at the very least, found to have been measured ineffectively. The result has been a tendency to concentrate on almost anything except the individual. Economic circumstances are important; marketing is important; finance is important; even public assistance is important. But none of these will, alone, create a new venture. For that we need a person, in whose mind all of the possibilities come together, who believes that innovation is possible, and who has the motivation to persist until the job is done. Person, process, and choice: for these we need a truly psychological perspective on venture creation.*

Endler in Naffziger et al. (1994:29) defines behaviour as a function of the interaction between the individual and the environment. Gartner (1989:696) adds to this that entrepreneurial behaviour is central in the process of venture development and that the entrepreneurial process plays a larger and more important role than merely gathering information about “who the entrepreneur really is”. Central to this environmental development and entrepreneurial process is the individual’s motivation.

### **2.6.1 Motivation**

Kreitner and Kinicki (1998:189) conceptualise motivation *per se* as those psychological processes where consciousness, direction and perseverance of voluntary actions that are purposeful, are created.

Sanzotta (1977:72) defines motivation *per se* as a threefold construct namely:

### **2.6.1.1 Motivation towards competitiveness**

Humans or individuals are defined as social beings that are dependent on group behaviour for support and survival purposes. Apart from the fact that humans are socially interdependent beings, competition or rivalry originates as a form of social interaction. This behavioural pattern develops as a comparative measure wherein, for instance, a situation develops where the best possible achievement is sought after. Within this framework motivation as such is regarded as the nucleus for the origination of rivalry or competition. Motivation can further act as a comparative measure for achievement and failure on the basis of the feedback function, created as a result of this in a competitive framework. This feedback acts throughout as an inherent formation instrument for further motivation towards higher levels of competitiveness.

### **2.6.1.2 Innate incentive**

The construct motivation is further described as a basic explorative incentive, which is derived from the inquisitive nature of man as such. Explorative behaviour is motivated by the search for new experience and the flexibility of man that enables him/her to adjust to these so-called new circumstances. This points to an individual who, due to his inquisitive nature, demands to go through a certain learning curve in order to gain the required knowledge to adjust to the “new”. This process is driven by motivation.

### 2.6.1.3 Acquired behaviour

It is generally accepted that motivation influences the learning process and learning *per se*. Accepting that learning does influence motivation can also turn around the argument.

Motivation is thus placed on an equal footing with learning. Motivation is not only taught but represents a vital integration with the learning process. The author states that the individual doesn't learn effectively if the motivation does not exist. In addition, those individuals who do not learn effectively possibly are not motivated because they have never learnt how to be motivated.

Motivation can therefore be a positive influence on learning as well as in the learning process: "The more you learned how to be motivated in the past, the more easily you transfer that motivation either to new learning, or more importantly, to new levels of incentives."

Therefore, as soon as it is easier to move on to higher motivational levels the nature of motivation will change dramatically.

Within this context it is of the utmost importance to investigate the entrepreneur and motivation as a characteristic of the entrepreneur. The motivation of the entrepreneur as an individual becomes absolute when placed within the entrepreneurial performance (E/P) perspective with the aim to integrate motivation as a driving force in the increase of entrepreneurial performance. Entrepreneurial performance as discussed has as a result the aim to increase for instance the profitability, productivity, the net value and growth of the venture. The so-called need

to achieve (Nach) that is absolutely present within the entrepreneur, is as a result discussed in detail.

### **2.6.2. The entrepreneur's need to achieve**

Gellerman, as quoted by Coetzee (1979:4), mentions the typical quality of the entrepreneur as follows:

They are well aware that big achievements do not come quickly or easily. Therefore they will mentally dig in for long, hard campaigns rather than hope for lucky breaks. Even their thinking is far more orientated towards the future, fuller of anticipation and attempts at logical predictions, than that of people without strong achievement needs.

In view of the above quote it is obvious that in respect of the entrepreneur, motivation must be put in the context of achievement motivation.

In the watershed work of David C. McClelland in 1961 entitled *The Achieving Society*, the hypothesis stated was that achievement motivation is partly responsible for economic growth. His basic hypothesis is that there is a strong correlation between economic growth and the need to achieve. His aim was not to prove that the need to achieve is the only determinant of economic growth, but that the appearance or the high presence of it partly plays a role in the increase of economic growth. Trumble (1983:33) and McClelland (1961:37) base their hypothesis on individual observation where the following logical psychological supposition is made: The more an individual for instance eats, the more he wants to eat. Based on the same analogy, the more an individual achieves the more he/she would like to achieve. These two

variables are described as relatively comparable to one another. Accordingly there has to be a certain motive to achieve or to reach a certain goal. This achievement is tied to a specific action behaviour. He therefore argues that the motives are rational or that it can be rationally deduced from the completion of certain actions. McClelland uses the “Thematic Apperception Test” – TAT” as an instrument to measure individuals’ motivation levels in terms of certain needs that need to be satisfied. A meta-analysis has already been completed which shows that the instrument is a valid one in the measuring of the need to achieve (Kreitner & Kinicki 1998:197).

Murray in Coetzee (1979:5) defines achievement motivation as the achievement and completion of something difficult or rather a difficult task or project. Further, in order to manipulate, organise or master certain physical objects, individuals or ideas. These actions need to be completed as fast and independent as possible, while hurdles should be overcome in this process. Achievement motivation also includes that the individual should surpass other individuals and over-achieve in relation to his or her own set goals. This action focuses on self-fulfilment with the aim to develop and realise talents. Heckhausen in Coetzee (1979:6) regards two fundamental motives as being an absolute part of achievement motivation namely first, the belief and hope in success and secondly, the fear of failure. He is quoted as follows:

*...the striving to increase or keep as high as possible one’s own capability in all activities in which a standard of excellence is thought to apply and where the execution of such activities can, therefore, either succeed, or fail.*

Trumble (1983:34) broadens the definition of achievement motivation and describes it as something that pushes the individual to complete a task faster, better, more effective and with less exertion. McClelland

proves through his research that actual achievement cannot be realised should there not be a strong need for achievement. McClelland argues on the ground of this statement that there exists a strong relationship between achievement motivation and the entrepreneurial behaviour of the entrepreneur. The relevance of the work of McClelland in relation to recent findings is deduced from the psychological characteristics that need to be present within the entrepreneur in order to be successful. These entrepreneurial characteristics are identified in the development of the achievement phenomenon. He specifies three universal characteristics deduced from the achievement motivation theory as present in the entrepreneur:

Firstly: **Problem solving** that forms an integrational part of an individual's responsibility. This includes the formulation of goals and the implementation and achievement of them through personal exertion.

Secondly: **Calculated propensity towards risk** that has to be described as an integrated function of ability and should not be calculated from a mere chance situation.

Thirdly: The entrepreneur has to have the **knowledge of the results** reached as well as make an **evaluation of tasks** that were completed.

McClelland therefore concludes that a high need to achieve (nAch") leads the particular individual or leads to entrepreneurial action behaviour. Hisrich and Peters (1998:69) associate themselves with the idea that the need for independence and the need of a high achievement level are two highly important determinants of entrepreneurial behaviour.

Smith and Milner (1984:488) come to a further conclusion by identifying five outstanding role characteristics and accordingly five kinds of motivation patterns related to it:

Firstly, the **individual achievement role** that develops from a motivational basis and which determines that the entrepreneur has a certain characteristic need that can only be satisfied through the personal involvement of the individual as well as the ability to link success to personal involvement. This causal link seems to be important.

Secondly, the **role of the inclination towards risk** that originates from the motivational basis determines that the entrepreneur will take a calculated risk falling within the borders of his/her personal abilities.

Thirdly, the **role of striving towards results**. This role is based on a motivational basis that develops the need to compile an index on a continual basis showing the current level of achievement.

Fourthly, a **personal innovation role**. This role is motivated by constant behaviour aimed at presenting or suggesting new, and thus creative and innovative solutions.

Fifthly, a **planning or goal formulation role**. The motivation for this important role is the development of the need for thought surrounding the future and the anticipation of the possible result within this framework.

The above-mentioned authors prove empirically that the entrepreneurs who fulfil these roles or strive towards the motive pattern can survive for longer and be more successful. These results are achieved through the

application of the following research instruments: The “Miner Sentence Completion Scale”, “Form T” and the “Innovative Technology” questionnaire. In terms of the hypothesis it is stated that individuals with a high need to achieve (nAch) are more likely to implement a faster expansion strategy that can be seen in the increase of entrepreneurial achievement.

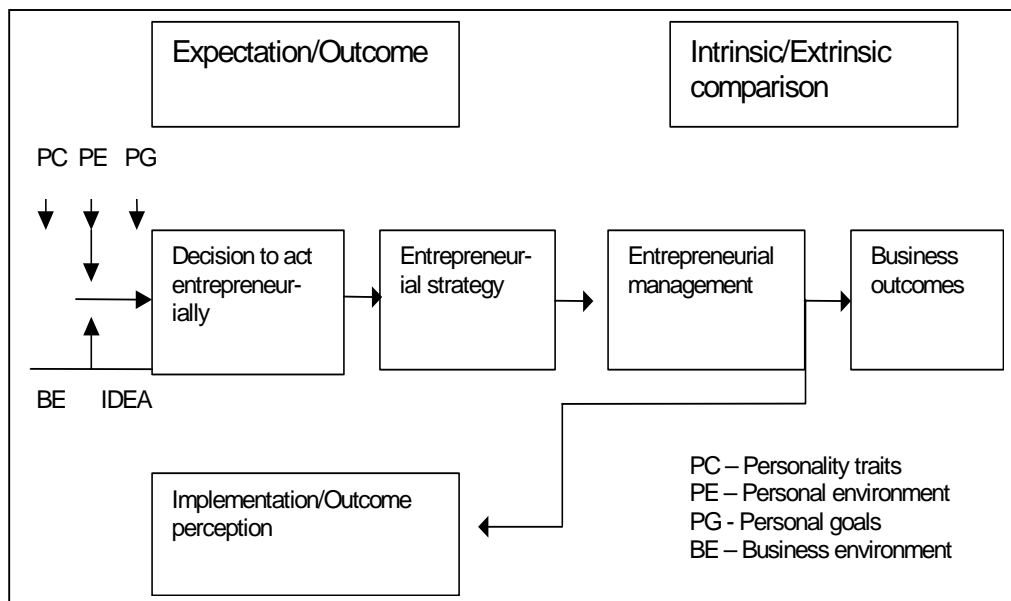
Begley and Boyd (1987:79) support the notion that the need to achieve may be regarded as entrepreneurial behaviour in the entrepreneur. Their study proves that a high level of achievement motivation can definitely be perceived in the typical entrepreneur rather than in the typical small business manager. The results of this study show that a high level of achievement motivation appears more often in the typical entrepreneur rather than the small business manager. The results of this study also indicate that those individuals with a high level of achievement motivation, i.e. “achievers”, set markedly higher and more challenging goals for themselves. This group of respondents also makes use of feedback as a handy measurement instrument to show that goals have been achieved. The entrepreneurs compete with their own achievement standards and are constantly looking for new ways to improve their performance. Sexton and Bowman (1985); Hornaday and Aboud (1971) as well as DeCarlo and Lyons (1979) have come up with the same research results in independent studies.

Cochran in Livesay (1995:159), however, emphasises the fact that a demotivating situation could originate within the achievement motivational framework. Should a constant incompatibility arise between the expectations or the potential outcome (as perceived by the entrepreneur) and the true results of the outcome?



Nafziger et al. (1994:31) states that too little research has been done into the motivation of entrepreneurs. Owing to this fact the authors developed an integrated model aimed at the total entrepreneurial process. They argue in favour of the model that entrepreneurship could exist within existing ventures (corporate entrepreneurship) as well as the well-known venture creator (entrepreneur). The basis of the theory or model is the premise that it is believed that entrepreneurs are motivated to achieve certain goals. Entrepreneurs define their experience as being successful in as much the goals were reached. The model is illustrated as follows:

**Figure 5: A model for entrepreneurial motivation**



(Source: As adapted from Nafziger et al. (1994:33))

Newly formed ventures call for both strategic and operational management. As a part of the process the entrepreneur becomes a manager and evaluates his/her set goals that are being met (for instance business growth) according to their importance. These evaluations form the motivational level of the entrepreneur and develop the need to act more entrepreneurially (for instance the implementation

of an expansion strategy). According to the above-mentioned authors it has a more holistic nature than the other models that are regarded as more simplistic. The primary motivational characteristic of this framework lies therein that the entrepreneur is motivated to act more entrepreneurially as long as it is known that this type of behaviour is instrumental in the achievement of goals.

Van Vuuren (1997) uses the absolute mathematical model of Atkinson and Feather (1961:214) where the strength of the tendency to strive towards a certain need for achievement is avoided, is noted. The result of their study has shown that the tendency to do something must be regarded as a function of the strength or motive to strive towards certain achievements and success (**Ms**); to prevent failure; (**Mpf**); the subjective possibility of success (**Ps**); or failure (**Pf**); the reward value of success (**Vs**); or failure (**Vf**). The value of the reward on the successful completion of the task is placed congruently against the level of difficulty of the task, or rather in a positive relation to one another. The above-mentioned authors therefore imply that the more difficult the completion of the task is, the higher the reward for it should be, the acquisition of the reward is, however, subject to the successful completion of the task. Atkinson and Feather postulate therefore that **Vs=1-Vf**. The value of the reward increases as a subjective probability or the possibility exists that the success will decrease. This implies that should the individual realise that the success rate is decreasing, he/she will do everything possible to change the situation back into the positive sphere. With this **Ps+Pf=1** and **Vm=-Ps**. The easier the task, the bigger the discomfort when the effort to complete the task successfully, fails. The inclination to approach success in this way can be mathematically presented as (**MsxPsxVs**), and the opposite by way of handling failure as (**Mpf x Pf x -Vm**).

The likelihood of completing a task (T=task) is represented as the difference between the two aforementioned inclinations or tendencies.

$$\begin{aligned} T &= (M_s \times P_s \times V_s) - (M_{pf} \times P_f \times -V_m) \\ &= M_s - M_{pf} (P_s[1-P_s]) \end{aligned}$$

Van Vuuren (1997) further states that these variables play a critical role in the increase or decrease of entrepreneurial performance (E/P). As has already been pointed out, entrepreneurs have a higher level of need for achievement than the normal individual or the “non-entrepreneur”. It is also important to emphasise the stimulation of the development of the need to achieve as an intervention in the increase of entrepreneurial performance. This aspect must be absolutely presented in combination with the following constructs: Entrepreneurial skills (E/S) and business skills (B/S). McClelland’s success rate in the identification of high entrepreneurial achievement would not have been possible if the mentioned abilities were not present.

Mahadea (1988:43) mentions that the need to achieve can be taught through a training intervention. He quotes the following authors who proved this statement empirically: McClelland and Winter (1969; 1987); Timmons (1971); Durand (1975); and Boshoff (1987).

In closing, it is important to note that training in achievement motivation, within the entrepreneurial context, is fundamentally aimed at emphasising rivalry and competition in order to set very high standards for achievement. This framework also includes the increase of entrepreneurial performance. The argument is concluded with the argument of Bartlett and Smith (1966) in Mahadea (1988:43) that

achievement training plays a large role in the development of achievement motivation and the generating of a need to achieve. Therefore, motivation on the one hand and achievement motivation on the other, plays a vital role throughout the training aimed at providing entrepreneurial as well as business skills.

## **2.7 Entrepreneurial skills (E/S)**

This study focuses primarily on the training to provide entrepreneurial skills (E/S), with specific emphasis on the concepts of creativity, innovation and opportunity finding. The other relevant concepts (E/S) will also be discussed in more detail. The scope of the study therefore excludes an intricate explanation of business skills (B/S), although the learner is intensely subjected to such skills training.

Entrepreneurial skills (E/S) involves skills embraced by the following concepts: Risk propensity, Creativity and Innovation, Opportunity identification and Role models.

The following table indicates how entrepreneurial skills (E/S) fit into the total entrepreneurship training model:

**Table 8: Entrepreneurial skills as part of the entrepreneurship training model**

<b>Entrepreneurial Performance (E/P)</b>	<b>Performance motivation (M)</b>	<b>Entrepreneurial skills (E/S)</b>	<b>Business skills (B/S)</b>
<ul style="list-style-type: none"> <li>▪ Establishment of own business</li> </ul>	<ul style="list-style-type: none"> <li>▪ Performance motivation</li> </ul>	<ul style="list-style-type: none"> <li>▪ <u>Risk propensity</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ General management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Completion of first transactions</li> </ul>		<ul style="list-style-type: none"> <li>▪ <u>Creativity and Innovation</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ Marketing skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Growth in net value of business</li> </ul>		<ul style="list-style-type: none"> <li>▪ <u>Opportunity identification</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ Legal skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Recruitment of employees</li> </ul>		<ul style="list-style-type: none"> <li>▪ <u>Role models</u></li> </ul>	<ul style="list-style-type: none"> <li>▪ Operational skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing productivity levels</li> </ul>			<ul style="list-style-type: none"> <li>▪ Human resource management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing profitability</li> </ul>			<ul style="list-style-type: none"> <li>▪ Communication skills</li> </ul>
			<ul style="list-style-type: none"> <li>▪ Business plan</li> </ul>

(Source: Adapted from Antonites (2000:21))

Hisrich and Peters (1998:10) accentuate that the entrepreneurial process involves more than just the mere “problem-solving in a typical managerial position”. The process is more complex and also comprises the necessary entrepreneurial skills.

As a historical background to the research and development of entrepreneurial behaviour and skills, Timmons (2000:218) provides the following development time frame (as adapted):

**Table 9: Time frame of development**

<b>Date</b>	<b>Researchers</b>	<b>Characteristics</b>
1848	Mill	Risk propensity
1917	Weber	Source of formal authority
1934	Schumpeter	Innovation & initiative
1954	Sutton	Need for responsibility
1959	Hartman	Source of formal authority
1961	McClelland	Risk propensity and need for achievement
1963	Dauids	Ambition; need for interdependence, responsibility and self confidence
1964	Pickle	Driving force, communication, technical knowledge
1971	Palmer	Risk assessment
1971	Hornaday & Aboud	Performance motivation, autonomy, aggression, power, innovation and independence
1973	Winter	Power need
1974	Borland	Internal locus of control
1974	Liles	Performance need
1977	Gasse	Personal value orientation
1978	Timmons	Driving force, self confidence, calculated risk, internal locus of control, creativity and innovation

1980	Sexton	Energy, ambition, positive failure management
1981	Welsh & White	Need for control, responsibility, self confidence, challenge need, calculated risk propensity
1982	Dunkelberg & Cooper	Growth orientation, independent orientation, skills orientation
1982	Scheré	Acceptance of uncertainty and chaos
1983	Pavetti & Lau	Conceptual skills
1985	Macmillan, Siegel, SubbaNarishimha	Knowledge of market and leadership
1986	Ibrahim & Goodwin	Ability to delegate, managing consumer and employee relationships
1987	Aldrich & Zimmer	Networking
1987	Hofer & Sandberg	Motivation and synergy
1987	Schein	Management skills
1987	Timmons, Muzyka, Stevenson en Bygrave	Opportunity seeking propensity
1989	Wheelen & Hunger	Implementation of business skills
1992	Chandler & Jansen	Self-analysis and opportunity identification
1992	McGrath, MacMillan en Scheinberg	Individualism, uncertainty and temperament

(Source: Adapted from Timmons (1999:218))

In the following sections these concepts are discussed in more detail.

### **2.7.1 Risk propensity**

Casson (1990:11) describes entrepreneurial risk as the result of insecurity that exists due to the fact that the success of market penetration can never really be determined beforehand. The correct prediction of the question by the entrepreneur would therefore be an indication of the success in the way of a decrease in risk. Hence, risk can be described as the possibility of innovation having an unwanted result.

Zimmerer and Scarborough (1996:48) regard risk as the conflict situation wherein the entrepreneur will find him/herself. Therefore all risk variables must be studied in depth with regards to the potential reward that could be a result of it. The authors refer to the successful entrepreneur as one who capitalises on the constructive effect of the conflict situation that originates when a certain risk is taken. This includes the decrease of the negative reaction that can develop from the accompanying exhaustion and frustration, which results from continuous failure.

In their opportunity evaluation model Zimmerer and Scarborough (1996:51) describe the following risks that could occur:

#### **2.7.1.1 Time risk**

The time implication of taking a new idea right through the product development phase until it could be considered right for the market.



#### **2.7.1.2 Investment risk**

This includes the cost of the establishment of a new venture, i.e. does the entrepreneur have access to enough capital to enable the venture to survive to the point of being an entrepreneurial institute? Other costs are those related to the total product development process, as well as those concerned with the physical manufacturing of the total product that will, for instance, satisfy the qualitative description.

#### **2.7.1.3 Technical risk**

All the technical aspects associated with the product development process are considered with the final product having to satisfy the set technical quality standards

#### **2.7.1.4 Competitive risk**

The possibility exists that competitors could be offering the same or comparable products in the market, while the success rate of competitors in comparable markets is also an indication of risk. The financial strength and depth of the competitor should not be omitted as a “follower” strategy by the competitor could pose further risk. The existing market advantage of the competitor as well as its existing distribution system, selling power and established relationships within the market place must be researched.

Deakins and Freel (1998:23) re-emphasise the calculated risk-taking trait of the entrepreneur. It is regarded as important to distinguish between uncertainty and risk. The entrepreneur manages uncertainty by means of analysing and evaluating risk possibilities to be encountered in future. The calculated nature of managing uncertainty and risk is still, though only to a certain extent, dependent on the existence of “chance”,

“luck” and “timing”. The projection of certain economic is not as predictable as in the past (e.g. inflation, exchange rates, interest rates and sales figures), and makes the risk evaluation process for especially the start-up entrepreneur, extremely strenuous. The whole opportunity identification process, which forms a core part of this study, integrates the assessment of risk factors.

### **2.7.2 Opportunity identification**

The identification of opportunities on a continuous basis is a differentiating characteristic of the true entrepreneur. Ardichvili et al. (2003:107) supports the importance of opportunity finding as an entrepreneurial skill, by citing the following authors: Bhave (1994); Schwartz and Teach (1999); Sing et al. (1999); De Koning (1999) and Sigrist (1999), and therefore implying their relevance in a entrepreneurship training programme. These models vary from cognitive inclinations to economic variables. The discussion on opportunity finding forms an integral part of this study and will be elaborated upon in more detail in Chapter 3.

### **2.7.3 Role models**

The influence of role models in the choice of entrepreneurial action can, in the context of this study, not be omitted or underestimated. To observe another person as a successful businessperson will obviously lead to the entrepreneur colouring in the picture for him/herself. The entrepreneur could even regard him/herself as being more successful than what is in front of him/her. Hisrich and Peters (1998:74) state that role models have a huge impact in the majority of job or career choices. The same statement can be made in the entrepreneurial context. Role models can be parents, brothers, sisters, or family members but

especially other entrepreneurs. For the potential entrepreneur the successful entrepreneur as outsider can act as a fundamental catalyst.

Within the training context the usage of successful entrepreneurs as example could act as a massive motivational technique. This aspect can both indirectly and strongly support the need for achievement and the achievement variables. Bagshaw (1996) uses successful entrepreneurs in a South African context, who could act as directive role models in any entrepreneurial training programme. This publication includes successful names ranging from Anton Rupert, Sol Kerzner, Pam Golding, Herman Mashamba, Sadek Vahed, Ranjit Ramnarain to Tony Factor and Themba Ngcobo. These examples reach over diverse cultural and gender borders and hold great value for the indication of successful role models in every entrepreneur's immediate environment or culture.

The use of role models could, according to Kreitner and Kinicki (1998:292), be a direct guideline for the entrepreneur in terms of certain role expectations that need to be present per definition. The entrepreneur can therefore realise that his/her chosen role model applies intensive innovation, took a calculated risk and strives towards unusual opportunities. Role insecurities could be removed as the entrepreneur can obviously see what is expected of the typical entrepreneur by making use of a role model to model him/herself on. The entrepreneur therefore places him/herself on an equal footing with the role model and in certain cases lets him/herself be motivated to the extent that even better achievement than that of the role model could be the result.

Apart from the expected entrepreneurial skills (E/S) that need to be present as content for the training model  $E/P=f [M (E/S \times B/S)]$ , the acquisition of business skills (B/S) is also of the utmost importance.

## 2.8 Creativity and innovation

Creativity and innovation form the primary focus of this study, and elaboration with regards to these concepts will take place in Chapter 4. Special reference should be made to the research done by Antonites and Van Vuuren (2002) that formed the basis of the current study. The aforementioned research assessed the content of entrepreneurship training programmes on a global level. Their research results have shown that creativity and innovation are included in 74% of all the entrepreneurship programmes assessed, and concurrently constitute the highest figure among the concepts measured. The following table indicates the different entrepreneurial skills measured as included in 70 entrepreneurship training programmes.

**Table 10: Entrepreneurship training programmes: Entrepreneurial skills**

Entrepreneurial skills	Frequency	Percentage (%)
All entrepreneurial skills	5	0.7
Creativity and innovation	52	74
Risk propensity	28	40
Opportunity identification	37	53
Role models	23	33
<b>N = 70</b>		<b>X = 50</b>

The high occurrence and presence of these concepts in entrepreneurship programmes without proper indication of the content thereof, was evident. This fact fuelled the need for developing a Creativity and Innovation Content model, applying the model and testing

its efficacy. The study therefore illustrates the process based on the preliminary findings of Antonites and Van Vuuren (2002).

Creativity and innovation forms part of the total training model and can be illustrated by means of the following table.

**Table 11: Creativity and innovation as part of the entrepreneurship training model**

Entrepreneurial performance (E/P)	Performance motivation (M)	Entrepreneurial skills (E/S)	Business skills (B/S)
<ul style="list-style-type: none"> <li>▪ Establishment of own business</li> </ul>	<ul style="list-style-type: none"> <li>▪ Performance motivation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk propensity</li> </ul>	<ul style="list-style-type: none"> <li>▪ General management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Completion of first transactions</li> </ul>		<ul style="list-style-type: none"> <li>▪ <b><u>Creativity and innovation</u></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Marketing skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Growth in net value of business</li> </ul>		<ul style="list-style-type: none"> <li>▪ Opportunity identification</li> </ul>	<ul style="list-style-type: none"> <li>▪ Legal skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Recruitment of employees</li> </ul>		<ul style="list-style-type: none"> <li>▪ Role models</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operational skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing productivity levels</li> </ul>			<ul style="list-style-type: none"> <li>▪ Human resource management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing profitability</li> </ul>			<ul style="list-style-type: none"> <li>▪ Communication skills</li> </ul>
			<ul style="list-style-type: none"> <li>▪ Business plan</li> </ul>

(Source: Adapted from Antonites (2000:21))

## 2.9 Conclusion

Leitch and Harrison (1999:105) attempt to exemplify the nature, relevance, content and appropriateness of entrepreneurship education by citing the work of Block and Stumpf (1992), Slevin and Colvin (1992), Gorman et al. (1997), Young (1997), as well as Kourilsky and Carlson

(1997). The first mentioned authors furthermore quote Stumpf (1992) directly in review of the current state of entrepreneurship education:

*...Rigorous research is clearly needed to understand the target audiences for entrepreneurship education, their unique educational objectives and learning styles, and the types of content to be covered for each audience, and which specific pedagogical methods will most effectively meet their educational goals. Such research must look at both the proximal criteria of student interest and immediate feedback as well as the more distal criteria of actual behaviour over ten or more years ... the most difficult and costly research on entrepreneurship education will involve the examination of different program content and pedagogical methods used to accomplish educational objectives.*

This study endeavours to answer the “content” and “effectiveness of the entrepreneurship programme” issues, with regards to specific entrepreneurial skills. Research interventions conducted to date to solve these specific research problems, are eminently limited, particularly with regard to the South African academic and business environment. This can be ascribed to the relatively youthful nature of the entrepreneurship science.

The fact that a need exists for further research in the field of entrepreneurship education and training supports the feasibility of this study. A primary focus is thus allocated to training in the following entrepreneurial skills: Creativity, innovation and opportunity finding. The foregoing concepts will be defined and explained in the following chapter, given the limited availability of literature and research done in this specialised field.

## **Chapter 3: The concepts: Creativity, innovation and opportunity finding**

*The history of scientific and technical discovery teaches us that the human race is poor in independent and creative imagination. Even when the external and scientific requirements for the birth of an idea have long been there, it generally needs an external stimulus to make it actually happen; man has, to speak, to stumble right up against the thing before the idea comes...*

*Albert Einstein*

### **3.1 Introduction**

The statement above creates a logic and direct linear conclusion between the role of entrepreneurship training as an intervention or external stimulus in the stimulation of creative idea development. Creativity and innovation are regarded as universally distinguishable variables in the make-up of an entrepreneur. Smoller and Sombart as quoted by Herbert and Link (1982), Weber (1930), Schumpeter (1939), Beaudeau (1767), Bentham (1838), Von Tunen (1850), Von Magoldt (1855), and Cole (1946), are all authors quoted and described by Van Daalen (1989:16-22), who regarded innovation in one way or another as an attribute or skill that is present in entrepreneurship.

The combined variables (creativity and innovation) actively differentiate the entrepreneur from the small businessperson, with the development of a “new” product or service as distinguishable proof. As early as the 1930’s Schumpeter (1939) supported facts with the statement that the entrepreneur is an individual of whom it is expected to consider and apply a new combination of production techniques and processes.

Vesper (1980:15) categorises and differentiates the entrepreneur as someone who strives towards the development of new products; the

development of a new production method; the identification of new markets and market opportunities and the discovery of new input providers and industrial re-organising or restructuring. All of the abovementioned phenomena are formulated with the “new” in mind, which simply imply “innovation” and is fuelled by creativity.

Carland et al. (1984) as quoted by Watson (1994:44) stresses the eventual difference between the entrepreneur and the average small businessperson/manager as the critical application or omission of innovation. The authors further point out that the entrepreneur is someone who is recognised as a person who ultimately prefers the development or creation of activity. This activity or activities are manifested through the innovative combination of resources with the aim to show a significant profit or entrepreneurial performance. This accentuation of innovative activities are combined with the frequent appearance of the motivation to achieve, the desire for power, aim orientation, internal locus of control, desire to be independent and a controlled propensity to take risks. Almost all the authors in the science of entrepreneurship thus accept that creativity and innovation are exclusive and that they are differentiating entrepreneurial qualities. These are prerequisites for the classification of “entrepreneurs”. It is therefore of the utmost importance to indicate the differentiating and integrating characteristics of innovation and creativity.

### **3.2 Historical background**

The concept “creativity” has always formed an important part of various disciplines, with a dominant root in the arts and psychology. However, Guilford in Sternberg and Lubart (1999:252) indicates that only 0.2% of abstracts submitted in psychological journals focused on creativity. Feist and Runco (1993:268-271) cited furthermore that this figure increased



slightly to 1.5% between 1975 to 1994. It is evident that non-empirical research on creativity exceeds the empirical. The role that creativity plays in society and likewise in entrepreneurship is unequivocally significant, but somewhat uncovered as a science.

To landmark the first evidential occurrence of creativity and creativity theory bounds to be irrelevant to the scope of this study. Couger (1995:12) cites the Bible as evidence to creative problem solving by recalling that as early as Moses' leadership this was engaged in when 500 000 Israelites were taken through the Sinai desert.

Rothenberg and Hausman (1976:31-48) provide a historical background to creativity referring to Plato, Aristotle, Kant, Galton and Freud, who had all influenced the history of creativity immensely. Plato described *inspiration* (a catalysing factor in creative behaviour) as a way to generate alternatives (within a "supernaturalist" context). Aristotle embraced creativity in an artistic context, whereas creativity is seen as part of natural laws and not as coming about merely by *chance*. Immanuel Kant first indicated the difference between "creation" and "imitation". His theory displayed that creative actions are directly dependent on "spontaneous activity" through the conscious mind. Francis Galton regarded creativity as the result of prepotency. He used the "genius" in line with the creative person, and stated that both contain talent qualities that flow from generation to generation and are thus inherited. The genetic inheritance of creativity is, however, a topic challenged in an array of research interventions over time. Sigmund Freud argued that the nature of creativity is a phenomenon that contains definite "dynamic factors" in the human mind with creative efforts as a consequence. He made his conclusions from analysing writers and comparing them with small children playing - both create an imaginative world which forms part of creative thinking and action.

Rickards (1999:26-33) constructed the following landmarks in creativity, as seen from a historical perspective:

- *Sultan, Köhler and the Gestalt School of Psychology*

Wolfgang Köhler concurrently with Max Wertheimer (founder of the Gestalt theory), explored the issues surrounding perception and reality during the *World War One*. Their research questions involved the observation of images changing from that which is motionless to the opposite. They also analysed the formulation of answers based on obstacles in thought. The Gestalt theory integrates certain mental processes to solve the latter. Their empirical research was conducted on apes in captivity. Sultan the ape, found novel ways of performing certain actions when in forced captivity (e.g. using a stick to reap his food closer). These experiments represented “characteristics of sudden unexpected discovery”. The research results provided insight into several contemporary studies on creativity.

- *Archimedes, Kekulé and “The Act of Creation”*

Arthur Koestler (1905-1983) researched the nature of the creativity process. His theories were documented in the book *The Act of Creation*. Koestler compared Archimedes’s bath experience (*Eureka!*) as an initiator of creation. This example served as a platform for the discovery theory and evolved in to the study of insight. He analogised the utilisation of insight as a problem-solving agent in the creativity process.

- *Wallas's four stages of creative thinking*

Graham Wallas (1858 – 1932) established the chronological flow of the creative process, derived from his theory on discovery. The different stages in his process are preparation, incubation, illumination and verification. This process still applied in various creativity development environments.

- *Brainstorming and the CPS (Creative Problem Solving) paradigm*

Alex Osborn developed a process during the World War II that refers to the generation of multiple ideas. These ideas were used to motivate fellow workers to generate new ideas in support of their country during the War. This whole process was based on the following dynamics, i.e. “postpone judgement”, “freewheel”, “hitchhike” and “quantity breeds quality”. Osborn’s actions led to the brainstorming technique. This technique plays a pivotal role during the idea production activity as part of the creativity process.

- *The whole brain metaphor*

Research, based on medical evidence, has shown that left and right brain hemisphere thinking exists. This evidence resulted from the work of the Nobel Prize winners, Bogan and Sperry (1969). Right brain thinking implies creativity while left brain thinking implies analytical logic. Another study showed that when the two hemispheres are physically divided (by removing the *corpus callosum*), it leads to decreased creative behaviour and achievement. This served as evidence for the “whole-brain” thinking paradigm and implies a more integrative approach to creativity.

- *Guilford's APA speech and his "structure of intellect" model*

Guilford cultivated pioneering work with regards to creativity development. His studies include a theory called "structure of intellect" that exposed the different "categories of thought" that exist when creative performance is achieved. Guilford's (1959) research resulted in the development of the well-known "divergent tests of creative thinking".

- *Torrance's Tests for Creative Thinking (TTCT)*

Paul Torrance developed validated instruments that measured individual creative talent. His tests are based on the "divergent thinking" theories of Guilford. The scope of application of *Torrance Tests for Creative Thinking (TTCT)* ranges from the measurement of individual creative talent to the effect of training interventions in catalysing talent employment. Torrance published more than a thousand academic articles on creativity.

- *Rhodes's 4P model:*

Mel Rhodes (1950) collected and analysed more than 40 definitions of creativity in order to develop a model of creativity. The model embraces four interdependent variables, consisting of the *person*, *process*, *product* and *press*. His work served as a pioneering agent in creativity research and development in describing the creative process, the research supported several studies. The 4P model contributed to the fundamental base of this study (see Chapter 4).

- *Edward de Bono and lateral thinking*

The widely known De Bono initiated lateral thinking as a method in unconventional and onorthodox thinking that leads to effective outcomes. He postulated the functionality of the brain as a “self-structuring information surface” and suggests a non-vertical way of thinking in order to utilise it productively and creatively. De Bono argues that thinking is a skill than can be acquired and developed. Lateral or non-vertical thinking is the nucleus of creativity and is thus a learnable and enhancable skill.

- *Gorden, synectics and the creative process*

W.J.J. Gorden is the co-founder of the creativity-inducing technique, *synectics* (the theory of combining divergent elements). The psychologist assessed the behaviour of engineering scientists during the invention process, and came to the conclusion, derived from his assessment, that certain behavioural changes (“psychological state”) take place immediately before a discovery occurs. This observation led to the formulation of the synectics technique. The technique, as briefly described, catalyses certain “psychological states” that improve new-idea generation by means of utilising “metaphors” and “manipulation”. Extensive evidence exists of increased creative performance due to the application of the synectics technique.

- *Teresa Amabile and the intrinsic motivation theory of creativity*

Teresa Amabile’s book entitled *Social psychology of creativity: a consensual assessment technique*, is one of the mostly cited works

in the field of creativity. Her work furthermore led to a new direction in social creativity research. The model suggests that certain intrinsic factors motivate the individual to operate on higher levels of creative behaviour. The environment, on the other hand, could provide the individual with obstacles in this process. The model consists of three components namely “task motivation”, “domain-related skills” and “creativity related skills”.

Rickards (1999:35) summarises the history of creativity in the following table, based on the foregoing description:

**Table 12: Creativity history**

<b>Change agents</b>	<b>Labellers</b>	<b>Experimenters and measurers</b>	<b>Contextualists</b>
De Bono’ lateral thinking	Wallas’s model	Bogan & Sperry’s whole brain	
Gordon’s synectics	Rhodes’ 4P model	Torrance’s TTCTs	Amabile’s intrinsic motivation
Osborn’s brainstorming	Koestler’s insight	Guilford’s SOI model	

(Source adapted from Rickards (1999:35))

### **3.3 Obstacles in creativity theory**

Sternberg and Lubart in Sternberg (1999:3-12) expand on the reasons behind the rather undeveloped study of creativity as a result of the following obstacles, mainly vested in psychological theory:

### **3.3.1 The study of creativity yields a mystical approach**

Mystical beliefs are in some instances connected to the creative phenomena or enigma. The authors quote Rothenberg and Hausman (1976); Ghiselin (1985) and Kipling (1937/1985) who compare the study of creativity with the mystical study of love, due to certain spiritual connotations. The mystic or vague nature of creativity in this context made empirical research somewhat challenging.

### **3.3.2 Pragmatic approaches to the study of creativity**

Scientists or practitioners have adopted a pragmatic approach towards creativity in terms of firstly developing creativity, secondly understanding it and the lastly with the testing of the validity of their ideas on creativity. Scientific theory is mostly misused for commercial purposes only.

### **3.3.3 Psychodynamic approaches to creativity**

A psychodynamic approach to creativity represents modern thought wherein creativity is seen as the “tension between conscious reality and unconscious drives”. Unconscious drives include variables such as “power, riches, fame, honour and love”. This theory is criticised due to the fact that it only resembles and focuses on cases of successful “creators” (e.g. Da Vinci). Weisberg (1993), as quoted by the authors, censure the theory as one that isolates creativity and also creates an unmeasurable concept.

### **3.3.4 Psychometric approaches to creativity**

The authors criticise the inadequate measuring instruments for creativity that are based on the normal paper-and-pencil tasks. Only two eminent

tests were developed over time, namely the Unusual Uses Test by Guilford (1950) and the Torrance Test (1974). The latter includes the following subtests: Asking questions; product improvement; unusual uses and circles. The subtests are based on divergent thinking and are scored for fluency, flexibility, originality and elaboration. They argue that although laboratory testing of extremely creative individuals (e.g. Einstein or Michelangelo) is impossible, certain measures should be developed to include “actual drawings” and “writing samples”.

### **3.3.5 Cognitive approaches to creativity**

Various scientists studied the mental process supporting creative thought. Some of these studies simplified creativity as a process where an “extra-ordinary” result is the product of an “ordinary structure”. This was concluded in a situation where creativity was not explored as a separate study but formed part of another. These studies only indicated a normal thinking process, for example generative creations or ideas. Creativity was thus seen as a concept in a larger thinking process and not a significant stand-alone item.

### **3.3.6 Social-personality approaches to creativity**

Studies on the social-personality thought included personality traits, motivational inputs to creativity and the social climate as inducing factors in the creativity process. The authors emphasised the work of Amabile (1983); Barron (1968, 1969); Eysenck (1993); Gough (1979) and MacKinnon (1965) as evidence of creative personality characteristics. The following variables represent these traits: Independence of judgement; self-confidence; attraction to complexity; aesthetic orientation and risk taking. Maslow’s (1968) theory also resembles certain critical creative traits e.g. boldness, courage,



freedom, spontaneity and self-acceptance. The whole self-actualisation process also preponderates creativity as a trait. The social platform for creative behaviour is supported by Simonton (1984, 1988, 1994); Lubart (1990); Maduro (1976) and Silver (1981), as cited by Sternberg (1999). These research studies investigated the influence of culture and anthropological aspects in creative behaviour. The obstacles created by studying creativity within the borders of cognitive, personality and social spheres are represented by the fact that cognitive studies neglected the social and personality variables. Henceforth the social-personality studies somehow dilapidated the subjacent mental processes to creativity.

### **3.3.7 Confluence approaches to creativity**

Contemporary studies on creativity elaborate on the confluence of different classical theories. Sternberg (1999:8) summarised the work of the following authors that support this paradigm: Amabile (1983); Csikszentmihalyi (1988); Gardner (1993); Gruber (1985); Lubart (1994); Mumford and Gustafson (1988); Perkins (1981); Simonton (1988); Sternberg (1985); Sternberg and Lubart (1991; 1995); Weisberg (1993) and Woodman and Schoenfeldt (1989). The confluence theory states that creativity consists of multiple dimensions. The theory therefore integrates cognitive, personality and social traits. This approach accentuates the fundamental importance of a supportive creative environment. The confluence approach must surely not be seen as an obstacle to the study of creativity, but rather as the current approach followed as part of an ongoing debate on the nature and occurrence of creativity.

Kaufmann, in Isaksen et al. (1993), adds his voice in respect of the lack of emphasis developing clarification regarding basic creativity theory

and concepts. He furthermore expresses his concern over the dominant trend in formulating testing instruments that are not based on the fundamentals of creativity.

### **3.4 Creativity defined**

The scientific process of defining creativity is a continuous effort covering a number of decades of research and reasoning. More than 100 definitions were formulated to describe the rather enigmatic concept over time and several attempts are documented in both academic and popular literature. The scope of this study is, in particular, not to define creativity extensively, but rather to apply an acceptable variable make-up within an entrepreneurship training context.

It is possible to define the concept “creativity” through a wide range of probabilities; from the direct derivation of the term “create” or “creating” to definitions that just point out the ways in which the inborn quality is increased, decreased or improved. De Bono (1996:3) defines creativity as the formulation or creation of something that was not previously available in its present state. Value is continually placed on or added to the new creation. This is compared to the work of an artist who is always creating something new, which consequently has a certain value. He also adds that this is not at all an “apparent “ or “easy” process. It is therefore important to note that something unique or unlikely forms part of it. The “unexpected” and “variation” are thus two fundamental constructs within creativity. Torrance in Jalan and Kleiner (1995) defines creativity as follows: *... a process of being sensitive to problems, deficiencies, gaps in knowledge, missing elements, disharmonies, and so on; identifying the difficulty: searching for solutions, making guesses, or formulating hypotheses about the deficiencies: testing and retesting them; and finally communicating the results.*

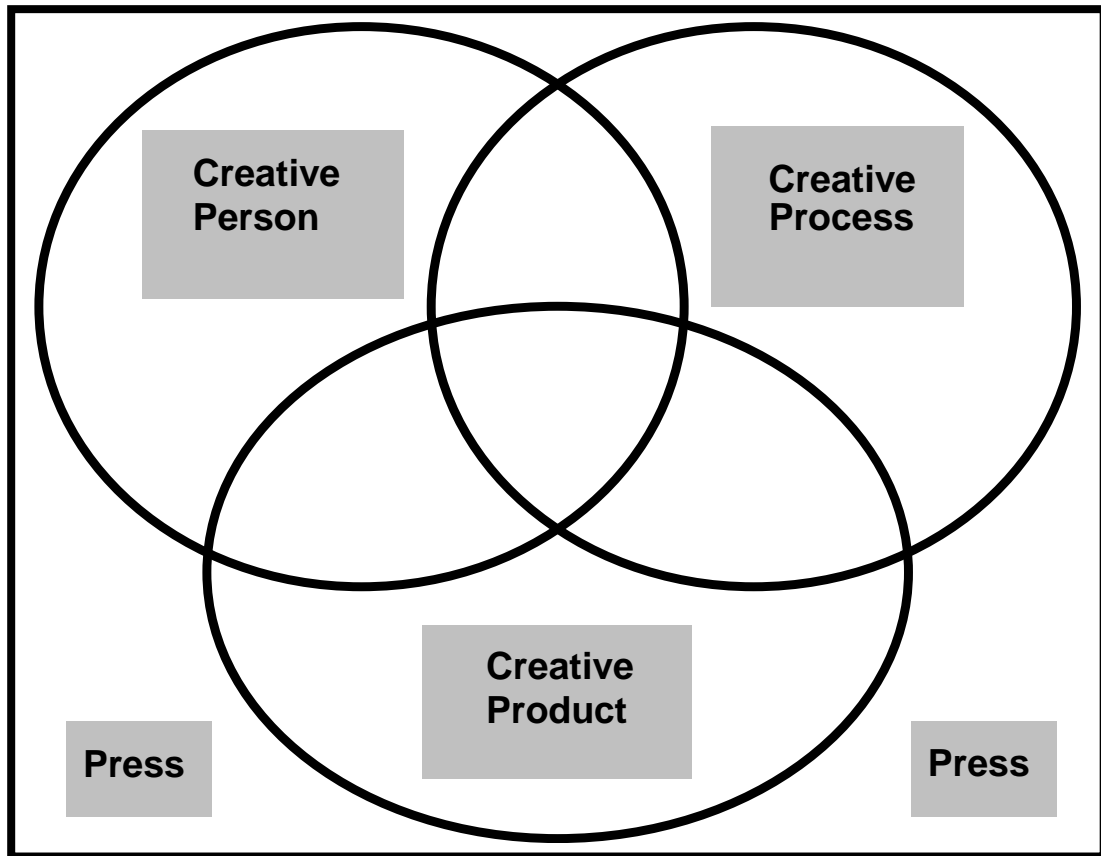
Couger (1995:14) points to the pioneering work of Newell et al. who classifies the definition of creativity under the following critical elements:

- The product of the thought process has to hand something “new” and/or valuable (for the reasoner or his/her culture).
- The reasoning has to be unconventional and it should change or readjust the historical thought processes.
- The thought process requires a high motivational and endurance input. This input has to be intense in the short term or continual through the long term.
- The initial problem has to be so vague that the whole process goes through an in-depth problem defining phase.

Botha (1999:17) managed to organise the majority of the definitions on creativity in an intensive attempt to search for a universal definition. The author quotes Davis (1992) stating that “there are as many definitions for creativity as there are people who have set their ideas on paper”. Her effort refers to the fact that, in reality, no monomorphistic psychological definition currently exists for creativity. It is evident that definitions vary from covering personality traits to the creative process or merely the outcomes of the process. Botha’s research paper categorised the multitude of definitions derived from the 4P model of Rhodes, as quoted by Davis.

The 4P structure (Person, Process, Product and Press) will serve as a definition classification framework and also formed the fundamental basis of the training model applied and tested in this study (see Chapter 6). The following graphic illustration shows the integrative nature of creativity (as formulated by the accepted definition thereof):

Figure 6: The 4P model of creativity



(Source: Adapted from Couger (1995:5))

### 3.4.1 The creative person

Botha (1999:38) reviews Sternberg in Davis (1992) who stated that the creative person is the result of three integrative psychological variables: Intelligence, cognitive style and personality. Mandler quoted by Smith et al. (1995:9) elaborates on the latter by defining creativity as the result of a cognitive process resulting in any form or degree of novelty. The cognitive process involves “individual or social context”; “deliberate or non-intentional”; “goal defined” dimensions; a “subjective sense of novelty” (does one really ever know whether an idea is novel or not?); “continuous or discontinuous problem solving”; “dreams” which

resemble novelty and “consciousness”, as well as “conscious or unconscious activation”.

Csikszentmihalyi (1996:45) distinguishes the creative person in a definition that states that no clear-cut characteristics can be allocated to the individual to declare him or her as someone who is able to create a novelty (e.g. a new product or service). The individual is creative on a cognitive level firstly due to his or her “genetic predisposition for a given domain”. A person with a definite sensitivity (“nervous system”) for colour will have an advantage in focusing on art. The same applies to a person with an attunement for sound who will have an advantage in music. A critical component of creativity is secondly an “interest in the domain”. This fact is also evident in the entrepreneurial environment, where a great number of successful new ventures were established due to the entrepreneur’s interest in a specific field, industry or even hobby. The third component in his definition emphasises the “access to the domain”. The role of the individual’s immediate social environment is an essential in creative thinking. The author correctly describes this domain as “cultural capital”. This environment may, for example, be “interesting books”, “stimulating conversations”, “role models” and “expectations for educational advancements” (see also the *creative press*).

Rothenberg and Hausman (1976:4) formulate a definition surrounding motivation, cognitive functioning, psycholinguistics and personality theory. The definition depicts the creative person as someone with an unusual thought with a positive outcome. Findlay and Lumsden (1988:9) define the creative person as someone with the ability to solve a problem in a situation where the context of the problem and interpretation is unclear. Boden (1994:75) defines creativity in a more simplistic way by means of perceiving a creative person as an individual who generates new ideas out of existing concepts with a result that is

normally “interesting”. The definition furthermore suggests that creative outcomes or novelties are not always supposed to be sustainable.

MacKinnon, in Isaksen (1987:120-130), disapproves the distinction made between creative personality traits and situational theories in defining creativity. The interaction amongst the variables is far more descriptive in defining the concept. The author suggests that future research in defining creativity and predicting creative behaviour (the *creative person*) should integrate these factors.

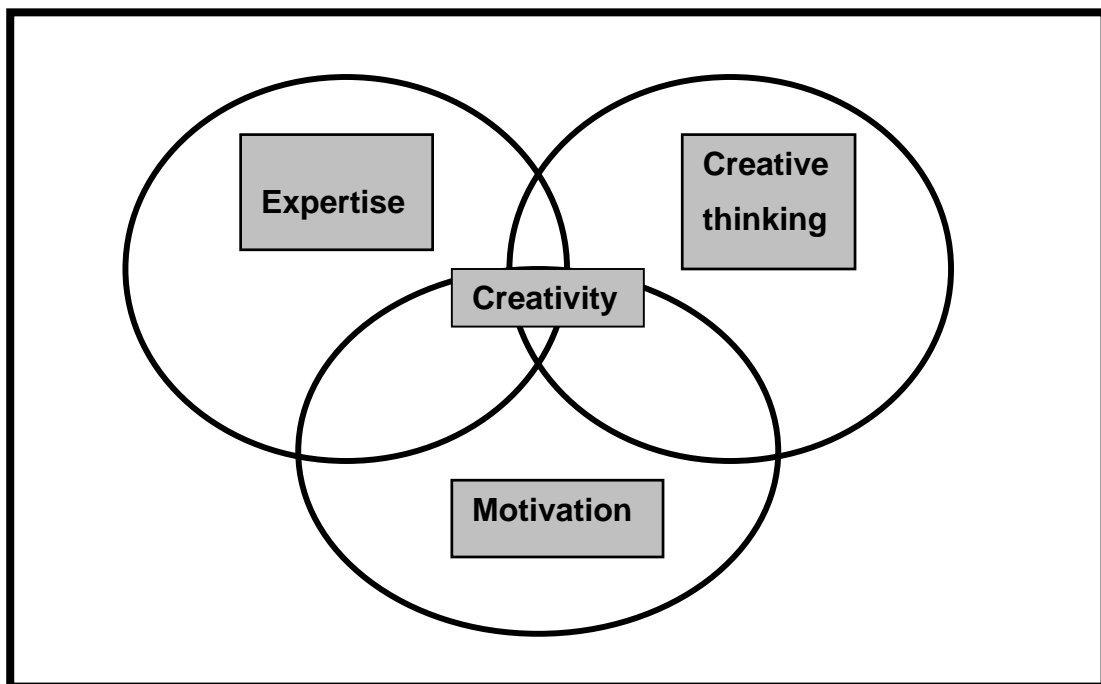
Shaw and Runco (1994:4-5) include affectiveness in their definition of the “creative person”. They observed the occurrence of creativity (within an affectiveness context) as being stimulated by “anger, fear, sadness and shame” as well as certain emotional responses, for instance “good feelings, walking on air and euphoria” and also “rejection, validation, external pressure, depression, anxiety and self-depreciation”. The authors consequently attach the “affective state” of the creative person as an important component of the definition and its inducing role in creative performance.

Davis (1986:15-16) cites Carl Jung who adds “vision” to the definition and notes that the creative person is a visionary individual in an unconscious state. Davis also quotes Otto Rank who defined the creative person as someone with a positive attitude and an “integrated personality”. The creative person should also be seen as a non-average individual. Ford (1999:2) defines the creative person as an individual with the ability to think in a divergent mode, as compared to the convergent. The latter entails a high level of similarity in thinking (a focus on centralised thinking) and a low level of abstraction. Divergent thinking embraces a high level of abstraction as well as a high

“disimilarity” in thinking (therefore applying techniques that motivate the free association of unrelated elements, themes or entities).

Amabile (1999:4) whose inputs are regarded as pioneering in the field of creativity, developed a “three-component model” that combines three interrelated concepts that, as a result, defines creativity the construct. The following graphic illustration indicates the composition of the model:

**Figure 7: The three-component model of creativity**



(Source: Adapted from Amabile (1999:4))

The above model suggests that the creative person is a function of “expertise”, “creative thinking skills” and “motivation”. Expertise pertains to knowledge of technical, procedural and intellectual aspects. Creative thinking skills embrace all the cognitive creative processes, for example, inspiration, imagination, flexibility and combining the non-conventional into a novel idea. Motivation refers to the desire to solve a problem or the drive (intrinsic motivation) to create the new. The combination and

integration of these variables results in creativity. Amabile's definition is a more practical effort and is primarily accepted and supported in the training model tested in this study (see Chapter 4).

McFadzean (2000:15) manages to conclude and summarise the traits of the creative person as follows:

- A desire to achieve a goal or winning attitude
- A high level of motivation, dedication and commitment
- A high level of self-confidence, not risk averse and accepting of failure
- The ability to link different (unrelated) elements or entities
- The assimilation of negativities regarding failed projects or attempts
- An ability to shift existing paradigms and assess different perspectives
- Problem and opportunity conceptualisation in a different or new frame of mind
- A "single minded" vision or road map
- A working style that induces hard work and relaxation in order to enhance incubation
- The ability to determine whether individual or group creativity should take place.

### **3.4.2 The creative process**

Davis (1986:60) distinguishes the different meanings of the creative process by means of the three different views. The first meaning involves the successive steps from identifying a problem up and till the novel solution thereof. Secondly it shows the expeditious "perceptual" changes that take place when new idea creation occurs in a short time frame. The third meaning encompasses all the techniques that are used



when new ideas or solutions are generated. Davis describes the basic process as one that starts with problem recognition, a solving phase and the final solution phase.

The historical course of creativity-process development (as recorded by Davis) started with Graham Wallas in 1926 who suggested a process that consisted of four steps namely:

1. Preparation (problem assessment)
2. Incubation (conscious and unconscious mental dynamic)
3. Illumination (new idea conception)
4. Verification (evaluation of idea/s).

Martindale, in Smith et al. (1995:251), confirms that the Wallas process was derived from the observations of Helmholtz (1896) who focused on the significance of the problem phase. Helmholtz suggested that the intensity of the preparation should not be neglected and that this phase creates a platform for the success of the eventual outcome. John Dewey developed a far more simplistic creativity-process in 1937 that resided in two basic steps:

1. A condition of uncertainty, “perplexity”, or a problem situation.
2. An inquisition phase that involves that acquisition of relevant information that will lead to an effective solution.

Kingsley and Garry as observed by Martindale expanded the previous process and transformed it into six phases namely

1. A difficulty is experienced
2. The problem is defined

3. An investigation into possible “clues” or alternatives is conducted
4. Several suggestions are presented and tested
5. An accepted solution is decided upon
6. The accepted solution is tested.

Torrence developed the following five-step process in 1977:

1. The identification of a problem or “gap in information”
2. Generating ideas or hypotheses
3. Testing and/or changing the hypothesis
4. Communicating the results.

Wallas’s process served as the blueprint for a multitude of processes that were developed and researched over time in the field of creativity. The basic structure and sequence of the process seems to be accepted amongst academia, scientists and practitioners.

The creativity process used in this study is a combination of the processes developed by Williams (1999:7) and Nystrom (1979:39). This process is an integration of all the variables as discussed in the foregoing section. It shows the mental and action-driven requirements needed in each stage in order to develop a new idea, product, service or process. These stages were applied in an entrepreneurship-training context and will be elaborated upon in Chapter 4.

**Table 13: The creativity process**

Stages	Requirements
1. Awareness and interest	<ul style="list-style-type: none"> <li>• Recognition of a problem or situation</li> <li>• Curiosity</li> </ul>
2. Preparation	<ul style="list-style-type: none"> <li>• Openness to experience</li> <li>• Analysis of how the task might be approached</li> <li>• Tolerance of ambiguity</li> <li>• Willingness to redefine concepts</li> <li>• Divergent thought processes (explore many possibilities)</li> <li>• Intuitive ability</li> </ul>
3. Incubation	<ul style="list-style-type: none"> <li>• Imagination</li> <li>• Absorption</li> <li>• Seeking ideas, possible answers and solutions</li> <li>• Independence</li> <li>• Psychological freedom</li> </ul>
4. Illumination (Insight)	<ul style="list-style-type: none"> <li>• Ability to switch from intuitive to analytical patterns of thought</li> <li>• Eureka!</li> <li>• A-ha!</li> </ul>
5. Verification	<ul style="list-style-type: none"> <li>• Critical attitude</li> <li>• Analytical ability</li> <li>• Testing</li> </ul>

(Source: Adapted and integrated from Williams (1999:7) and Nystrom (1979:39))

### 3.4.3 The creative press (environment)

The context within which creativity takes place, or the creative environment, has attracted a multitude of research interventions. The main focus in defining creativity in an environmental context or the creative systems approach focused on the educational environment.

The more contemporary studies focused on the work environment. The majority of these studies assessed factors that contribute to creative productivity. These variables served as critical components in defining creativity. Plucker and Renzulli as documented by Sternberg (1999:35-51), cite Amabile, Hill, Hennessey and Tighe (1994); Oldham and Cummings (1996) and Gough (1979) who found evidence (in various stages) that a challenging work environment influenced the creation of new ideas or products positively. The successful interaction and interrelatedness amongst the variables Person, Product and Process appear in a creativity induced environment.

McManus (1999:2) reviews the work of Carl Rogers (1954:348) and quotes him directly:

*“In industry, creation is reserved for the few – the manager, the designer, the head of the research department – while for the many life is devoid of original or creative effort. With scientific discovery and invention proceeding, we are told, at the rate of geometric progression, a generally passive and culture bound people cannot cope with the multiplying issues and problems. Unless individuals, groups, and nations can imagine, construct, and creatively revise new ways of relating to these complex changes, the lights will go out.”*

The environment in which an individual finds him/herself actuates the existence of creative behaviour and performance radically. Rogers (1976) developed three conditions for a supportive environment in this regard:

#### **3.4.3.1 Existensibility: Openness to experience**

The creative environment should motivate the non-existence of boundaries and conventional limitations. The individual therefore needs to assess new information in an original context in order to establish creative thought. The author accents certain variables in the social environment that hinders openness of thought: past experience, cultural boundaries, social norms, fears and anxiety of future outcomes. Existensibility is the basic opposite of defensive psychological thinking.

#### **3.4.3.2 Internal locus of evaluation**

A creative environment is also an environment that permits the individual to evaluate his/her own novel idea and/or product without the criticism of externals. It thus implies that the environment should allow individuals to firstly develop confidence in what is regarded as new and secondly to take the risk that enables differentiation. The theory does not exclude the appraisal or feedback of others, but the initial assessment should be vested in the individual. Amabile (1983) supports this aspect and claims that castigation from an external source normally has a negative influence on creative development. Intrinsic motivation should be fostered and yields much higher creative performance than punishment from outside in terms of being non-creative. Torrance (1995) found, in the latter context, as derived from various longitudinal studies, that creative results should be rewarded. He states, however, that rewarding creativity should be excluded from “false premises”, distortions of the truth and the failure to test hypotheses.

This phenomenon is a somewhat neglected component of learning and is also ignored in conventional education systems. This study and

training model supported intrinsic motivation and evaluation as a platform for creative and innovative performance in an entrepreneurial context.

#### **3.4.3.3 The ability to toy with elements and concepts**

A creative environment needs to tolerate the ability to “play”. A non-rigid set of rules should facilitate the opportunity to explore problems in a playful manner in such an environment. This includes the free generation of ideas, inclusion of colour, appreciation of different figures and exploring the combination of unrelated concepts. Rogers (1954), as displayed in McManus (1999:6) stresses, however, that “play contributes to creative productivity only when it facilitates opportunities to increase the complexity of consciousness or the power of intrinsic motivation”.

McManus (1999:7) suggests that “complexity” be encouraged because of its integral position in the creative environment. She states, in a training context, that the following aspects should be part of the creativity-training environment and will encourage complexity:

- encourage the flow of stimulating information;
- ensure informational feedback whenever possible and as quickly as possible;
- provide new experiences and create sources of information;
- process whatever learning occurs;
- share stories of successes and failures; and
- tolerate mistakes as inevitable, i.e. learning through experience or trial and error.

The training environment should not only encourage complexity but also create safe psychological spaces (e.g. constructive communication) and flexible boundaries that accept the existence of new information.

Torrance (1995:28) defines a creative environment as a “responsive” surrounding that is fuelled by curiosity. Individuals must assess the new within a curious manner. Many novelties have been the result of a highly responsive environment. Torrance also indicates that a number of gifted children have ended up unsuccessful due to the non-existence of a responsive environment. The training environment, within an entrepreneurial context, should for example promote responsiveness in the sense of motivating learners to generate new ideas without the punishment resulting from the so-called unfeasible nature of some of the ideas.

#### **3.4.3.4 Barriers within the creative environment**

Certain variables in an environment may not be conducive to creative development. These variables are seen as barriers to creativity. Barriers are normally blockages to thinking and acting creatively. These barriers are based on the individual and will influence many tasks in the workplace. Antonites in Nieman and Bennet (2001), identified the following barriers to creativity within an environmental context:

- **The social environment**

The social environment entails all the variables affecting the human being, whether individually or in group format on a social or societal level. The following factors in this environment can influence creative behaviour negatively:

- A lack of understanding and support for new ideas in communities, among peers and parents.
- Many families have an autocratic decision-making structure, and therefore do not allow children to think independently.
- Risk taking is not allowed.
- Culture and certain customs or beliefs within a sub-culture might form barriers to creative behaviour (e.g. women in particular African cultural structures are not allowed to own or run entrepreneurial ventures. Their sole purpose is to raise children.)

- **The economic environment**

- Broadly speaking, the macro economy does not support the development of new ideas and products (e.g. an enabling environment that advances entrepreneurial performance).
- There are no growth prospects in the economy.
- No financial support is available for the development process of new products.
- Risk taking is seen as a negative element of the economy.
- No rewards exist for new and feasible ideas.

- **The physical environment**

- There are continuous or once-off distractions in the thinking process (e.g. disruptive sounds, climate and energy).
- In the education and training environment the venues are conventional (e.g. even rows and grey/dull colours).



- The existence of routine or related tasks (e.g. you have to eat, work, study and sleep as part of a specific timetable and routine).
- The work routine consists of always conducting the same tasks at the same time and in the same way.

• **Cultural barriers**

The study of the influence of culture on creative behaviour is a field on its own and not the main scope of this study. However the role of culture in creativity development is not neglectable. There are more than 12 different cultural groups in South Africa. Each one of them has characteristics that will, at some point in time, negatively or positively influence creative development. It is important not to stereotype in this regard due to the sensitive and proudness factors involved in cultural beliefs. The following barriers are reckoned to be generic cultural barriers:

- Individuals have to go to school, after that study at a university or college, then find a job with a governmental institution (cultural mindset). Entrepreneurial endeavour is not a feature of such a cultural group.
- The unknown is unsafe and therefore risk averseness is the rule. Although calculated, entrepreneurship entails a certain level of risk-taking.
- An expectation is created in certain cultures, which prescribes that one has to be practical and think economically before your ideas can be generated.
- To ask a question, or to question an issue, is impertinent and unacceptable.

- Stereotyping implies making assumptions about certain issues without proper knowledge of the background or particulars of the matter, with specific reference to cultural characteristics.
- The policy of a company is to follow strict orders and procedures, and also stay in line with the organisational structure.

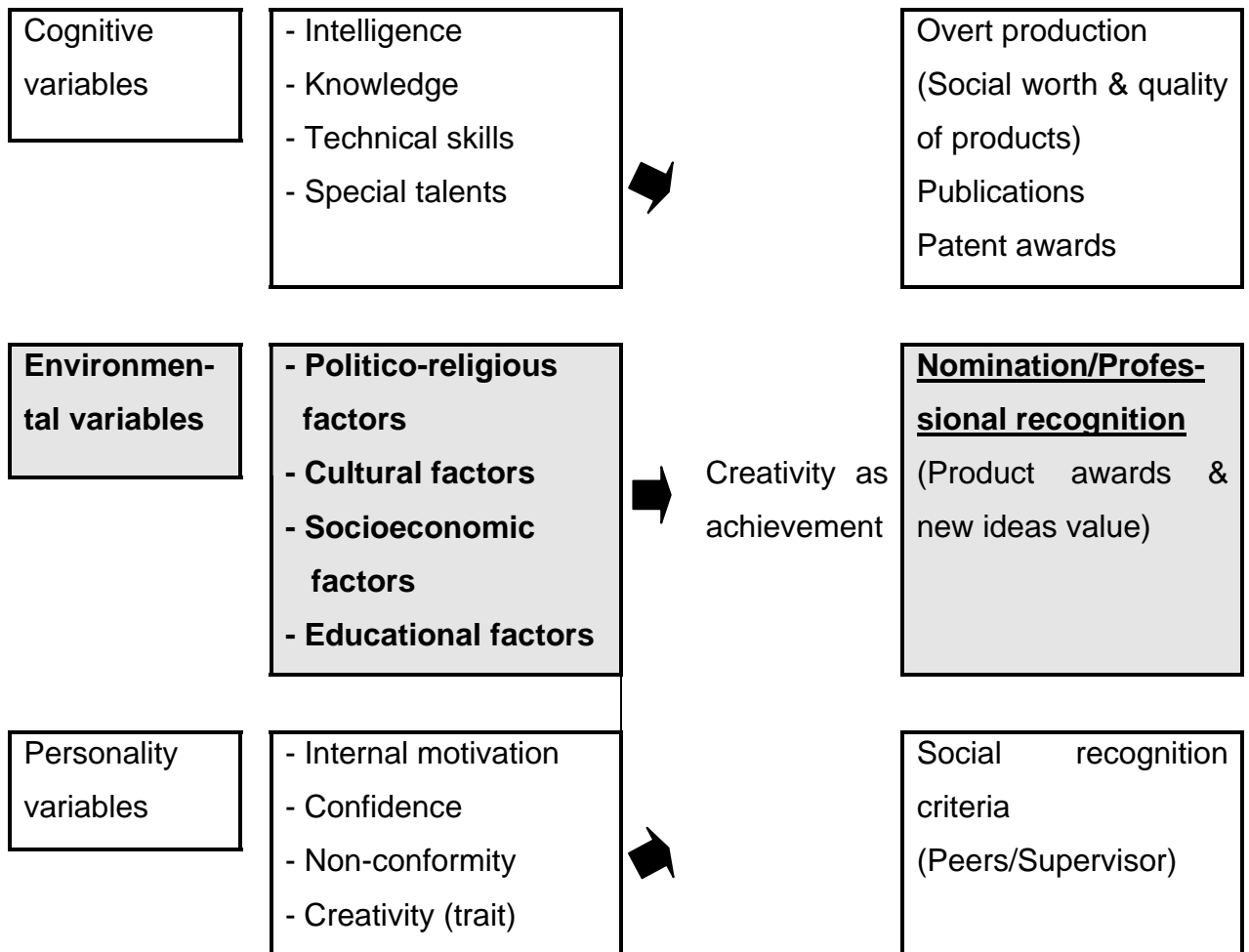
- **Perceptual barriers**

Perceptual blocks are barriers in the way of perceiving things (objects and/or abstract figures) clearly and correctly. The following aspects are potential blocks to creativity:

- Applying a narrow mindset to analyse problems. An example in this regard is for instance idea anxiety. Here one has an idea and you focus on the “great” idea without analysing the relevant facts supporting it.
- Making assumptions about a problem or idea without a holistic viewpoint or displaying an inability to structure the problem and evaluate the smaller elements.
- Prematurity. Individuals tend to assume that something will work without proper marketing research or feasibility studies. In this case they rely on the intuitive ability only.
- Characteristics and even the utilities of the new product are sometimes perceived differently by the owner in comparison to the potential customer. In many new products this perceptual block has resulted in failure in the market place.

There is a variety of barriers that influence an effective creative process negatively. It is also possible to add intellectual, emotional and time barriers to the process, and it is advisable to try and remove these barriers before embarking on any means of creativity. The work of Paul E Torrance needs to be re-emphasised: A responsive environment cultivates creative development and performance. Eysenck, in Boden (1994) as cited by Botha (1999:42) graphically illustrates the relationship between the environment and trait creativity:

**Figure 8: Trait creativity and the environment**



(Source: Adapted from: Botha (1999:44))

The illustration shows *inter alia* that environmental factors (e.g. politico-religious; cultural; socio-economic and educational) contribute

fundamentally to specific creative achievement, in this regard, in the form of recognition for the creation of a new idea or product. This view should be seen against a holistic framework, integrating cognitive and personality variables with the role and influence of the environment. Csikszentmihalyi (1996:127) argues that evidence exists of instances where the environment was disregarded, e.g. Michelangelo painting a ceiling in physically challenging circumstances and many classical poets who created outstanding work in small and clumsy tents. He disputes, however, that the “spatiotemporal context” in which an individual finds him/herself will affect creative behaviour. The author supports Eysenck’s illustration in terms of the importance of the environment for the creation of new ideas and/or products as well as an environment that accepts newness.

In conclusion, Murdock et al. in Isaaksen et al. (1993:116-119), graphically summarise the conceptual components of the definition of creativity as described in the foregoing discussions:

**Table 14: Conceptions of creativity - an analytical simplification**

	<b>Definition</b>	<b>Key elements of the definition</b>	<b>Analytical simplification themes</b>
<b>Person</b>	<p>Everyone has a creative capacity.</p> <p>Everyone has a different way of expressing it.</p> <p>There is a constellation of other relevant factors including motivation, personality, traits, skills and knowledge.</p>	<p>Creative capacity.</p> <p>Found in everyone.</p> <p>Different ways of expression.</p> <p>Constellation of relevant factors.</p>	<p>Creative capacity.</p> <p>Found in everyone.</p> <p>Different ways of expression.</p> <p>Constellation of relevant factors.</p>
<b>Processes</b>	<p>A dynamic reconceptualisation that results in potential for change, action, or a product which is original, functional for individual and/or larger audiences.</p> <p>Found in all people and influenced by cognitive, motivational, personality,</p>	<p>Dynamic reconceptualisation.</p> <p>Results in potential for change, action, or product.</p> <p>Original, functional for individual or larger audience.</p> <p>Found in everyone.</p> <p>Constellation of influences.</p>	<p>Dynamic reconceptualisation.</p> <p>Results in potential for original, functional, change, action or product.</p> <p>Found in everyone.</p> <p>Constellation of influences.</p>

	historical/ecological, developmental, biochemical, change.		
<b>Product</b>	A person establishes processes within a process which leads to products. There are tangible and intangible outcomes. You don't need to look at what led to the creative product. Some criteria for products are newness, relevance/ Appropriateness, elegance.	Tangible/intangible Outcomes of creative activity. Criteria: newness, relevance/ appropriateness, elegance	Tangible or intangible outcome (product) as a starting point for definition of creativity. Creativity is newness, relevance/ Appropriateness and elegance.
<b>Process</b>	A viewpoint to enable us to go beyond our immediate good idea or solution to any problem.	Viewpoint enables going beyond immediate good idea.	Viewpoint enabling going beyond immediate good idea.

(Source: Adapted from Murdock et al. in Isaaksen et al. (1993:116-119))

The authors furthermore compiled the following table, as derived from an in-depth analysis of research studies on creativity, in terms of how creativity should be developed in direct correlation with the definition:

**Table 15: Nurturing and developing creativity – an analytical simplification**

	<b>Key elements of change</b>	<b>Analytical simplification themes</b>
<b>Person</b>	How creativity is manifested is determined by combination of culture, outcome, approach, and person. This contributes to diversity. The level at which you are nurturing creativity determines variables for nurturing. More coordinated efforts among researchers. Be sensitive to natural setting which you are entering.	Know what, where, how, and who you are nurturing – it all affects how creativity is manifested. Level at which you are nurturing creativity determines variables for nurturing. More coordinated efforts among researchers.
<b>Process</b>	Balance: Divergent and critical thinking. Problem statement and emerging problem clarification. Continuity between theory and practice. Tools to prepare people and make process enduring.	Balance certain elements of process. Refine tools to prepare people for process and engage in process. Continuity between theory and practice.
<b>Product</b>	Importance of creative productivity and skills. Outcome provides context (domain) for concrete learning: Know it, then nurture it. Nurturers need to be nurtured. Research is needed. Organisations: Need to find ways to break creative barriers.	Outcome provides context for concrete learning. Nurture product evaluation. Nurture nurturers. Research. Organisations: Need to find ways to break creative barriers.

<b>Press</b>	<p>Model based on client needs. Realise that when you are nurturing creativity, you are going into an ongoing system. Understand it. Theory related self-reflection is a powerful tool. Organisations: look at metaphors</p>	<p>Model based on client needs – takes into account level of involvement, role, experience, motivation and change. Model, which is sensitive to the current environment, works with it and builds on it.</p>
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(Source: Adapted from Murdock et al. in Isaaksen et al. 1993:116-119)

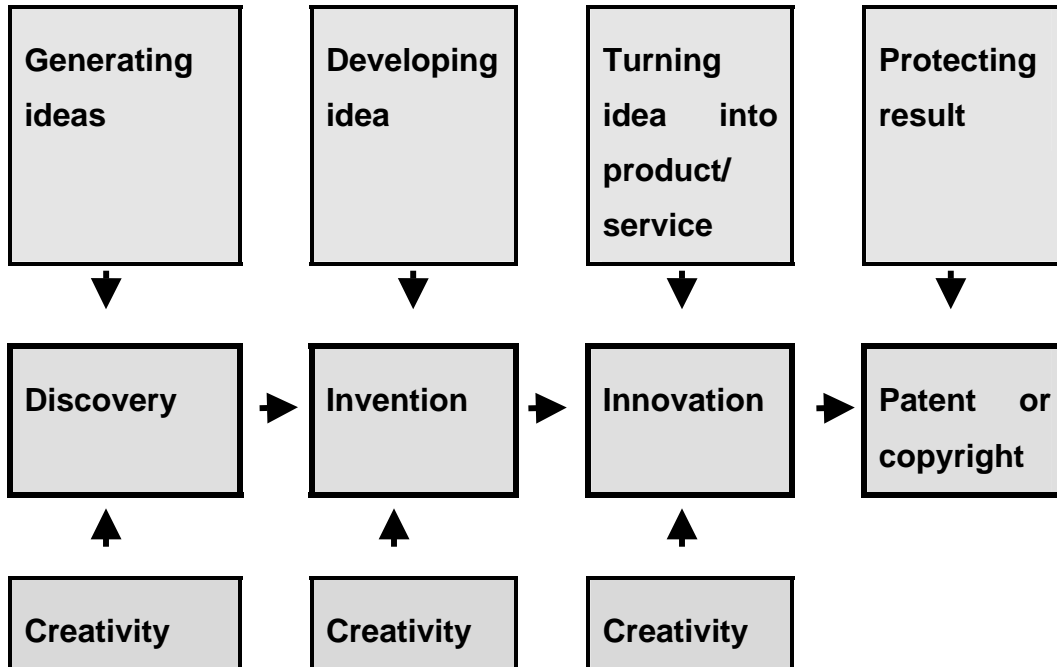
### 3.4.4 The creative product

The result of creative thinking is defined as the novel outcome or product of creativity. The product can be seen as anything new that results from thinking creatively or applying creative techniques that encompasses creative thinking. The “new “ may range from ideas to physical and tangible products and intangible services or processes. The result of creative thinking in an entrepreneurial context is seen as an innovation, which will theoretically be expanded on in this chapter.

Creativity is furthermore seen as a catalysing agent in the creation of new products. The following graphic illustration shows the influence of creativity in the creation of new products, thus being the result of creative thinking.



**Figure 9: The influence of creativity in the creation of new products**



(Source: Adapted from Couger (1995:18))

The figure illustrates that the “product “ of creativity is more than just a new idea. Creativity forms a platform and integral input into the total developmental process. The following “products” or outcomes are thus the result of creativity, as derived from the graph:

- **Idea generation**

A multitude of options is generated in order to, for example, solve a problem, address a market need, or change the existing. Emphasis is placed on quantity and not quality. Badie (2002:68) suggests, however, that effective idea generation is not merely the result or outcome of creativity, but needs to be perceived as part of integrated analogical thinking. An integrated analogical thinking frame work

accompanied with creativity, serves as a focusing and targeted process that results in far more successful outcomes-based methodology.

- **Idea development**

A number of suitable ideas are chosen and filtered until the most viable option comes to light. The analogical thinking or reasoning method, as discussed in the previous paragraph, gives purpose to idea development, again an integrated approach to creative thinking.

- **Discovery**

A discovery normally occurs without purpose or accidentally. In relation to invention that needs a systematic thinking and operating process, discovery still needs some testing, in order to determine the feasibility thereof.

- **Invention**

An invention is directed in line with a goal. The entrepreneur realises for instance that a technological product will become obsolete in six months time. The invention process is then based on various research and testing interventions, before the new or changed product is commercialised.

- **Innovation**

The exploitation of the invention is seen as innovation. The new invention is now developed into a unique product, service or process.

All the variables as discussed, are the result of creative thinking. Couger (1995:286) argues that the product of creativity should be based on a two-fold measurement, firstly novelty or newness and secondly utility or value added. The author lists a number of characteristics of the product of creativity as measured in order to determine its novelty or utility:

- Qualified intellectual activity or creative strength
- Usefulness
- Newness accompanied by overcoming certain difficulties in the creation process
- A proper experimentation phase before the novel “instrumentality” took place
- Negative perception and scepticism before the success of the novelty
- An unsatisfied need, before the product existed
- Proof of increased income/sales after the introduction of the product (thus value added)
- Evidence of precise novelty: “novelty of a combination”, “novelty of a new application”, spatial and kinematic novelty”, novelty of a deletion of useless parts” and “novelty of a substitution”.

The author cites Brogden and Sprecher, stating that only 14 studies up to 1995 showed evidence of how to measure the actual novelty of a product, therefore being the result of the creative thinking process. No progress on this was found in the search for more recent findings, thus opening an opportunity for further research.

### **3.5 Myths of creativity**

In the interest of training it is important to stamp out some common misperceptions surrounding creativity as identified by De Bono (1996:31-40).

#### **3.5.1 Creativity is an innate talent and cannot be taught**

If creativity were only an innate talent there wouldn't have been any sense in developing the phenomenon any further. Therefore, if nothing was done about creativity, it would just remain an innate talent. But, should training, structural and systematical techniques be applied, the general level of creative abilities could be improved. This argument is supported by the fact that certain individuals will still achieve more than others, but that any one can develop certain creative abilities. Thus there is no contradiction between "training" and "talent". The author adds that to learn creative techniques is in no way more difficult than learning certain sports or mathematics for instance. In this regard De Bono (1996) is quoted: "it may not be possible to train a genius – but there is an awful lot of useful creativity that takes place without genius".

#### **3.5.2 Creativity is a phenomena linked with the so-called rebel**

De Bono compares the typical conformist at school level with the typical rebel. The rebel differentiates him/herself from the conformist by a certain temperament, which points to an individual who isn't interested in the normal flow of things. It is therefore logical to argue that the rebel will seem more creative in later life than the normal child or conformist, who just adjusts to the general status quo. The rebel is also the individual who aims to challenge existing concepts and undertakes certain tasks in a different way. This individual thus has the courage and energy to

develop alternative viewpoints. Traditionally this individual is placed within the creativity frame of reference. The author states that this tendency is currently changing with the conformist realising the value and compensation associated with the “new game” and aiming to adjust to it. He further points out that the possibility exists for the conformist to gain far more than the rebel from the acquisition of certain creative techniques.

The conformist isn't necessarily opposed to something as is the case with the rebel, but this person can use the opportunity more constructively and could add new value to existing ideas which hold certain advantages for the development and training of entrepreneurs. Reference is also made to the Japanese culture where group conformation stands opposed to individual eccentricity. However, this conception is changing with the Japanese economy realising the independence of creativity and acknowledging and implementing it. This process is implemented in the same way that quality consciousness was established in the past as a trademark of the Japanese economy.

### **3.5.3 Right brain versus left-brain**

Van Vuuren (1997) holds the view that the ability to think creatively is a right-brain activity. De Bono (1996) broadens this viewpoint and warns against a simplified opinion, namely that creativity is simply the application of right-brain activities. He describes this argument namely that left-brain activities should be negated in creative behaviour deceptive with regard to the creative thought process. The left-brain plays an important role in the systematic process where concepts and perceptions are seated. It is therefore in the left side of the brain where concepts and perceptions are formed and stored. De Bono (1996) proves this argument with the application of the “PET” (“Positive

Emission Tomography”) test. This instrument revealed that right and left-brain activity occurs simultaneously during creative behaviour.

#### **3.5.4 Art, Artists and creativity**

Owing to the broad application and definition of “creativity” the direct conclusion is made that this concept is directly linked to artists and the practice of the arts. This implicates that should creativity be taught, artists are being formed and trained at the same time. De Bono states implicitly that this is not the case. He describes the advantages of creativity as the changing of certain concepts and perceptions. This aim is reached through the usage of lateral thinking which implies that thoughts and actions do not take place in the same linear way as usual. He thus indicates that even artists may become trapped in a certain stagnated way of thinking and acting that doesn’t include a high level of lateral thinking. The flexibility that is inherent to creativity is therefore not applied in the aforementioned example. Artists can also be more analytical which doesn’t necessarily point to lateral or creative thought. The author furthermore states that the misconception exists that only artists can be trained in creative thought and actions. Emphasis must therefore be placed on the fact that creative thought implies the changing of existing concepts and perceptions and implies an educability which, in turn, holds certain advantages for the stimulation of creative thought as a prerequisite for entrepreneurship and as a component within a training frame of reference.

#### **3.5.5 Exemption**

De Bono (1996) suggests that the result of creativity training can be seen in the liberating feeling created through it in the individual. This also includes the awakening of the internal potential of creativity of

which the individual wasn't aware before. It is a known fact that individuals function more creatively should the space and opportunity be created to freely "play" with new thoughts and ideas. The conventional educational situation doesn't necessarily or usually create the opportunity for the individual to accept he/she may go of his/her inhibitions and shouldn't belittle him/herself should a mistake be made. The trainer/facilitator should continually emphasise that the individual should at all times feel free to express him/herself with the aim to overcome inhibitions and act creatively.

### **3.5.6 Intuition**

De Bono (1996) points to the dual nature of intuition and its influence on creativity. Firstly, insight is associated with intuition where something is suddenly experienced as "new". The aim of this specific creative technique is to develop the nature of insight. Secondly, insight is associated with a feeling that is developed through experience and consideration. The content or steps taken that lead to this feeling aren't easily enunciated and therefore intuition is rather described as "thought". As a result of certain experiences one develops a certain feeling in respect of questions and decisions. It is, however, dangerous to argue that all creative thought is formulated around the intuition concept, because should this have been the case all decisions would have been based upon this and the completion of tasks would also have depended on it. De Bono (1996) repeats that intuition is in fact, an important component in the lateral thinking process. It must therefore be seen as a bonus if it adds something positive to the process.

### **3.5.7 The need for “craziness”**

Creativity is generally accepted as being “less serious” and sometimes also regarded as “crazy”. This argument is easy to support and explain, because to think in a different way is often experienced as somewhat crazy. Within this framework, creative individuals can often, according to the perceptions of the rest of the group compete in a crazier (unorthodox) way than is generally accepted as the “norm”. The author regards provocation as a valid way of implementing lateral thought. The result of this is that the individual is released from the normal perceptual pattern and left with an unstable thought situation. He or she is stimulated further to develop new ideas. This process is purposefully and systematically implemented and is based on logical asymmetrical patterns and systems. The mere craziness is thus cancelled out by instituting a formal process to stimulate creative acts. The individual is enticed to formulate new ideas rather than embark on mere craziness. The application of this technique can also be of the utmost importance in the training of entrepreneurs where the development of ideas is seen in a realistic and serious light.

### **3.5.8 The group versus the individual**

Traditionally creative thoughts are largely stimulated in groups by making use of various techniques. One of these techniques is known as “brainstorming”. Through the application of this technique it is indicated that that creative thought should be a purposeful group process. Other people in the group stimulate the individual in the group’s idea generating rather than the individual who just “waits” for inspiration to develop ideas. De Bono, however, states that group-motivated actions are not a pre-requisite for creative thought. Through the application of the provocation technique more emphasis is placed on the individual.



The development process is therefore not dependent on the input of the group. In a group situation, the individual often has to sit and wait and listen to the ideas of others. He/she is often forced to repeat his/her idea to ensure support for it. From time to time the group follows a direction that doesn't agree with the individual's individual direction and this often distracts from his/her continued attention and participation. He, however, emphasises that the social aspects of group participation is very valuable and that it takes active discipline to function on an individual basis. It is therefore important to indicate that purposeful creativity isn't necessarily a group-oriented action. This argument also holds far reaching implications for entrepreneurial training.

### **3.5.9 Intelligence and creativity**

Getzel and Jackson (1996) as recorded by De Bono (1996) indicate that up until an IQ (Intelligence Quotient) of 120, creativity and intelligence are comparable. After this the confluence splits. It is held that individuals with a higher IQ are often not motivated to speculate about new ideas. The highly intelligent individual regards any new idea and abnormal idea as absurd and he/she would not be very likely to support it. The individual with a much lower IQ, on the other hand, would be more likely to implement the mentioned lateral thinking techniques. This implies that the individual with a higher intelligence has lower creative abilities, and accordingly so, also the less intelligent individual. These creative thought abilities are educable and hold enormous advantages for the training of creative thought abilities in the entrepreneur.

De Bono (1996) concludes by referring to the fundamental advantages of creative thought. These advantages are closely linked to the prerequisites for successful entrepreneurial behaviour and achievement. Firstly, improvement. The most noticeable characteristic of successful

creative thought lies in the nature of it to improve the individual's situation. The individual can use creative thought as a means to improve various situations. This points to the development of an idea, resulting in the improvement of an uncomfortable or undesired situation, process or even product. Secondly, problem solving. Should the standard procedure for the completion of a task or process followed not show the desired results, creative thoughts and ideas are used or developed as solution alternatives. Thirdly, value and opportunity. This advantage is linked to the creation and adding of value as well as the designing of opportunities. Within the entrepreneurial framework the advantages of a new opportunity and/or the development of new products/services or processes are indicated. This also includes the correct positioning of products in the required market situation. This advantage is regarded as part of the entrepreneurial enthusiasm and process. Fourthly, a futuristic viewpoint. Consideration within a future framework calls for a specific reasoning ability.

Creative thought can be seen as a way by means of which the future can be indicated. All results and actions can be generated within the light of creative alternatives. Creativity can thus be experienced as a motivator through whom the entrepreneur is interested in what could be around the corner for him/her. Through this method the entrepreneur is forced to react in a pro-active manner to alternatives in contrast to a reactive approach. This process requires well thought out creative thinking processes. The misconceptions as indicated in the work of De Bono are supported by Adams; Parnes; Torrence; Davis, Miller, Newell et al. and Raudseep, as referred to by Couger (1995).

Creativity and creative thinking as a single construct is a catalyst in the creation of the new. The final result, within an entrepreneurial context, results in the occurrence of an innovation (e.g. new product, service or process). The construct innovation therefore needs explanation.

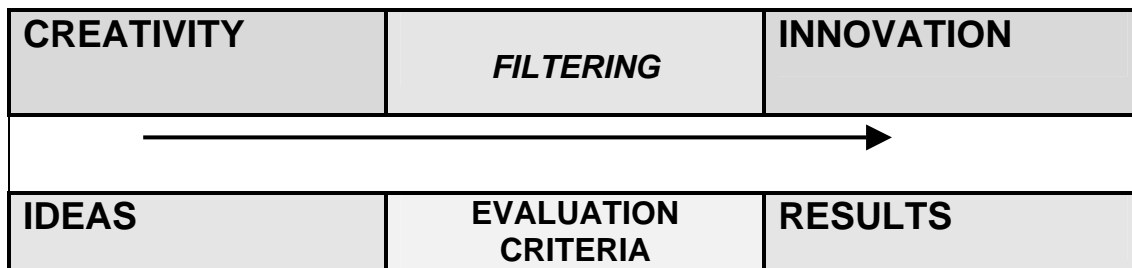
### 3.6 Innovation

Majaro (1988:27) differentiates between creativity and innovation as constructs. Creativity is the thought process that leads to the development and generation of ideas. Innovation is the practical implementation of the idea concept to ensure that the set aims on a commercial, profitable basis are met, in line with a specific opportunity in the market environment. Innovation is therefore ideas that seem to be newer, faster, more cost effective and possibly more aesthetical. This implementation should be usable, practical and aimed at showing results. Figure 10 in this chapter illustrates the position of innovation as a result of creative thought.

Gilmartin (1999:34) locates innovation between creativity and opportunity identification, and regards creativity as the foundation for innovative behaviour. Zimmerer and Scarborough (1996:80-95) broaden the above-mentioned viewpoint by stating that, between the idea generating process and the innovation process, a systematic filtering process should take place. This process acts as a development mechanism, with the aim to change “raw ideas” into tangible, value-driven innovations.

The process can be diagrammatically presented as follows:

**Figure 10: The development of innovation**



<b>Daydreaming</b>
<b>Flights of fancy</b>
<b>Brainstorming</b>
<b>Observation of other individuals</b>

<b>New innovations</b>
<b>Better innovations</b>
<b>Faster innovations</b>
<b>More cost effective</b>
<b>More esthetical</b>

(Source: As adapted and changed from: Zimmerer & Scarborough (1996:91))

It would subsequently be important to discuss innovation as a concept in broader terms, due to the fact that the innovation process is ultimately the commercialising of the entrepreneur's ideas.

Gee and Tyler in Martin (1994:2), point out that innovative undertakings contribute more to economic growth and job creation than others. Furthermore, newly industrialised and developing states' economic ability to grow to maintain international competitiveness, is largely determined by the presence of technological innovation. Cumming (1998:6) divides the innovation process into three consecutive steps: Firstly the birth of the initial idea (creativity), secondly the successful development of that idea and thirdly the successful application of the

idea. He developed a comprehensive and inclusive model that indicates the different factors which have a positive effect on the three steps.

**Table 16: Summary of factors having a positive effect on each of the three steps**

Diverse information sources	<b>Birth of initial idea (Creativity)</b>	Risk taking encouraged
Staff with diverse interest		Adequate resources
Supportive management		Good strategic direction
Failures willingly tolerated		Free information exchange
Freedom to pursue own ideas		Brainstorming encouraged
Success recognised		Access to external stimuli
Patent programmes		Non-constraining environment
Suggestion programmes		Technically competent team
Non-conformity tolerated		Challenging environment
Adequate funding		<b>Successful development</b>
Adequate manpower	Clear project objectives	
Management's belief in project	Full-time team members	
Risk taking encouraged	Enthusiastic cooperative team	
Strong project champion	Empowered team	
Senior project champion	Use of external expertise	
Strong project leader	Users' needs understood	
Good project selection process	Good contact with users	
Good source of project ideas	Thorough development	
	<b>Innovation</b>	
Meets customer's needs	<b>Successful application</b>	Outperforms current products
Value for money		High quality implementation

(Source: Adapted from Cumming (1998))

Though more suitable for an existing business' need, Cumming's model is also applicable in an entrepreneurial context. It is also evident that all

types of entrepreneurship are based on innovative acts. It serves as a prerequisite of change in the pattern of allocating resources, as well as new abilities to add value to new possibilities for the positioning of products or services in certain markets.

Drucker (1994:20) suggests that innovation is an entrepreneurial instrument, one which is used to develop a differentiated undertaking or service. It is possible to regard innovation as a discipline in itself, where it is possible to be taught as well as to practise. He adds that entrepreneurs should purposefully search for sources of innovation, as well as changes and their symptoms. This could point to certain opportunities for successful innovation. It is furthermore also important to identify the principles of innovation and to successfully implement them.

In this regard Drucker (1994:20) is quoted as follows:

*Entrepreneurs are a minority among new businesses. They create something new, something different, they change or transmute values...they always search for change, respond to it, and exploit it as an opportunity.*

The origin of innovation is of the utmost importance. It is critical that the causal relationship that leads to the invention of the successful instrument is pointed out. Drucker identifies seven resources of innovative opportunities:

- **The unexpected**

Unexpected success, or failure and the unexpected external incident are highlighted. IBM is a very relevant example pertaining to unexpected success. IBM developed computer equipment to use in

banks during the 1930s. Due to the depression of the American economy nothing could in reality be sold to the banks. However, state libraries saw this computer equipment as very advantageous for their systems. All stacked stock was sold, which resulted in unheard of and unplanned success. It is also relevant to mention Akio Morito's statement as quoted here by Martin (1994:4):

*I do not believe that any amount of market research could have told us that the Sony walkman would be successful, not to say a sensational hit that would spawn many imitators. And yet this small item has literally changed the music-listening habits of millions of people all around the world. Many of my friends in the music world, such as conductors Herbert von Karajan, Zubin Mehta, Lorin Maazel, and virtuosos like Isaac Stern, have contacted me for more and more walkmans, a very rewarding confirmation of the excellence of the idea and the product itself*

- **Incongruency/Incompatibility**

Incompatibility exists between reality as it appears in practice and as it is supposed to be. During the 1950s it seemed that the aeronautical industry would definitely surpass the shipping industry. The costs of the shipping industry as a result increased and the speed at which stock reached their final destination went down dramatically. The result of this tendency was that more and more stock was heaping up in the harbours, leading to a higher incidence of theft. The industry tried to resolve the problem by manufacturing faster ships. This solution, however, was very capital intensive and as a result the economies of scale didn't improve. A solution was, however, developed with the invention of the process during which the products were loaded into specific cargo containers on land and then merely loaded onto ships as packed entities.

- **Innovation relies on the need for process**

The task-related nature, rather than the situation-orientated source of innovation is emphasised. The change occurs within the processes of the venture, industry or service. The importance of the completion of a specific task is crucial. It also points to the improvement of an already existing task or process, or the replacement of a missing or weak link in the process of the development of a new process, based on newly generated knowledge. This need arises where everyone in the venture or industry realises that there is a problem in the process, but virtually nothing is being done about. Should a solution to the problem be found, it is usually accepted as obvious and later on as the standard.

- **Changes in marketing and industry structures**

These phenomena usually occur unexpectedly. The change in the market structure of any industry (for instance the information technology industry), often creates opportunities for innovation. Should there be a definite change in the market structure, all role players should adapt to it. In this instance the leadership is often replaced.

- **Demographic changes**

Change in the make-up of the population includes those relating to the size of the population, age structure, composition, rate of employment, educational levels and income, which then creates innovative opportunities. The Internet *per se* formed a platform for new venture creation by innovative young entrepreneurs.



- **Changes in perception, state of mind and reason**

It could be most dangerous when the temporality of change with regards to perception is not addressed correctly. It is therefore important to distinguish between real perception shifts and mere fads. True innovations that influenced dramatic changes seemed to be sustainable products or services, and not short-term occurrences.

- **New knowledge**

Both scientific and non-scientific knowledge is emphasised. Knowledge-based innovation features high on the list of successful innovations. These innovations aren't necessarily of a technical and scientific nature, but can also feature on a social level. There is a relatively long waiting period between the origination of new knowledge and the true implementation of it as new technology. Furthermore, there is a waiting period for new technology to appear as a new product or service. The product of the inventor of chemotherapy, Paul Erich took 25 years to come into use. Rudolp Diesel had to wait 35 years before the diesel engine was commercialised.

The first four changes usually take place within the entrepreneurial enterprise. These are changes that are largely visible within the specific service or industry sector. Drucker (1994:25) points out that these four are mainly symptoms, but that they are worthy indicators of changes that have taken place, or things that can be changed with relatively little input. The last three changes or resources of innovative opportunities are visible outside the entrepreneurial enterprise or industry. It is important to notice that there is a high level of interaction between the

seven resources. It is also important to analyse these resources separately as each resource has its own unique qualities.

Burch (1986:14) adds another source of innovation namely self-development. This includes the provision of raw materials, intermediary products, alternative materials or methods.

According to Hyvarinen (1993:11), the environment as such plays a vital role in the stimulation of innovative behaviour. This environment includes economic support structures, support groups, training, infrastructure, political influences, competition, location, tax “know-how”, economic growth and the diffusion rate of innovation. Hisrich and Peters (1998:8) attach reason to this by demanding that entrepreneurship and innovation is not only about the ability to create and conceptualise, but rather about the ability to consider all the forces in the environment.

Miller and Friesen (1982:54) strongly emphasise the environmental factor by pointing out that the more dynamic and competitive the external environment, the larger the chance of innovation presenting itself. When competitors’ products “change” faster, or when consumers’ needs fluctuate, the occurrence of innovation will flourish. Pinchot and Pinchot (1996:24) suggest that a certain climate has to evolve wherein new ideas can be generated and made operational. The entrepreneur often acts as the climate controller during the innovation process. This climate supports the general belief in the success of the new as well as a climate where daredevilry, inquisitiveness and perseverance are stimulated.

On a practical level Pearson (1993:7) identifies important qualities of innovative ideas and activity. This has a peculiar impact on the allocation of resources and the cash flow position of the entrepreneur.

The study is based on two dimensions of insecurity, namely possible areas of implementation and the possible approach to be followed. He therefore implies that there are various uncertainties and challenges, which are to be identified before ideas could successfully be developed as innovations. These factors include the opposition or lack of interest from the existing system (for example the community), technical problems and the inability to support the innovation. It also includes viability in the market place as well as the survival of the innovation should time scales exist, especially as a result of the financial impact.

Herzberg, in Whiting and Solomon (1989:78), supports the latter and proposes that the source of innovation be situated within the input of the individual. He demands that the innovative individual should have the necessary subject-orientated knowledge. The success of the ongoing innovation by the entrepreneur is tied to a life-long learning curve.

Grindley, in Cozijnen and Vrakking (1993:62), confirms that high levels of knowledge of functional abilities, a knowledge centre of technology and market behaviour combined with a certain experience could play a significant role in the successful implementation of innovation.

There are, however, certain obstacles to the implementation of innovation in the market place. Piatier (1984:102) describes the following three aspects as universal stumbling blocks in a way of the implementation of innovation. Firstly, the risk involved (financial or personal). Secondly, time lags between the invention and the actual implementation of the ideas. Thirdly, the cost involved, especially with intensive production processes. This includes the substantial cost of patent rights, research and development.

Sahlman and Stevenson (1991:76) regard success as the biggest problem for further or continued innovation. It is important to create a willingness to accept an existing product as being outdated or obsolete. The authors point out that too many entrepreneurs change existing products incrementally, thus making them faster, better or less expensive instead of developing new products and services. This phenomenon is especially prevalent in the information and communication technology (ICT) environment where incremental change is not found to be attractive and where success in the industry is closely linked to fundamental innovation and change.

Quinn (1985:73-84), on the other hand, argues that it is advantageous to change incrementally as sufficient critical information can be gained. Mistakes in the development process can be avoided in this way. In a training context Zimmerer and Scarborough (1996:90) regards the fact that “only one answer exists for each question” as a big strain on innovative behaviour as well as the fact that emphasis is not placed on the handling of failure and problem solving.

The tendency to value past achievement too much could, as mentioned, be a large hindrance for entrepreneurial performance and innovative behaviour. In a training environment it is thus of the utmost importance to point out to the entrepreneurs involved that continual self-development is of great value in the area. Training as such is currently seen as inhibiting to effective innovative behaviour and implementation, as indicated by various authors. Education and training *per se* values standardised decision making rather than unconventional decisions. The latter shows a high correlation with innovation. The opportunity to think in an unconventional way allows the entrepreneur or potential entrepreneur the opportunity and creates the ability to handle ambiguity or chaos effectively.

Herzberg in Kreitner and Kinicki (1998:379) describes innovation as being dependent on chaos and uncertainty.

*“The greater the tolerance for ambiguity, the more one’s internal freedom to experience”.*

The acceptance of the feeling of “I don’t know” creates the opportunity for innovative behaviour. The entrepreneur should thus find pleasure in creating situations where uncertainty exists. This situation should create a feeling of certainty for the entrepreneur in contrast to the negative cycle that could be created by training, for example where chaos and uncertainty are avoided and the handling of it has total ineffectiveness as a result when it does occur. From this, one can conclude and add that an entrepreneur is a person who consciously develops a passion, and strives towards uncertain situations in his or her environment. This passion frees the entrepreneur to experience the spontaneity of the moment and appends largely to impressive innovative idea. The authors are quoted as follows: “Innovative people are sensuous. Their minds work as a whole – the discipline of the neocortical brain, the emotions of the mammalian brain, the aggression of the reptilian brain. Logic, color, and energy are combined into a passionate intuition.”

The authors developed a model that points out the individual qualities of an innovative individual. The authors analyse the following required qualities:

- **Intellectual ability**

This is the ability to see problems in a new way, and the ability to cross the borders of conventional thought; the ability to distinguish between ideas that are worthwhile to investigate and those that

aren't; the ability to influence and persuade other individuals. It includes obvious and explicit knowledge of the area of interest, problems, products and services. There is a preference for new thoughts regarding own choices to be made.

- **Personality traits**

A willingness to overcome obstacles; to take calculated and worthwhile risks; to accept and handle ambiguities and chaos and self-efficiency are regarded as positive personality traits.

All the above qualities are largely motivated and strengthened by intrinsic task motivation, which is part of a successful entrepreneur. The fact remains that these variables can be taught as was pointed out by various authors and the omission of this aspect definitely won't set up true entrepreneurial achievement.

### **3.7 Opportunity identification**

*"I was seldom able to see an opportunity until it had ceased to be one"*

- Mark Twain

It is important to point out the fundamental difference between the entrepreneur's idea and the opportunity the idea is destined for. Timmons (1999:80) defines an opportunity as a phenomenon that seems attractive. Attractive in the sense of the profitability that it poses for the entrepreneur as well as attractive with regards to the value it will hold for the consumer who is destined to use it. This opportunity must be maintainable and temporary. Opportunities in the free market system usually present itself where the situation is changing. A form of chaos is also present which is consequent with knowledge and information gaps.

This is as a result of certain vacuums/openings present in the market or business branch.

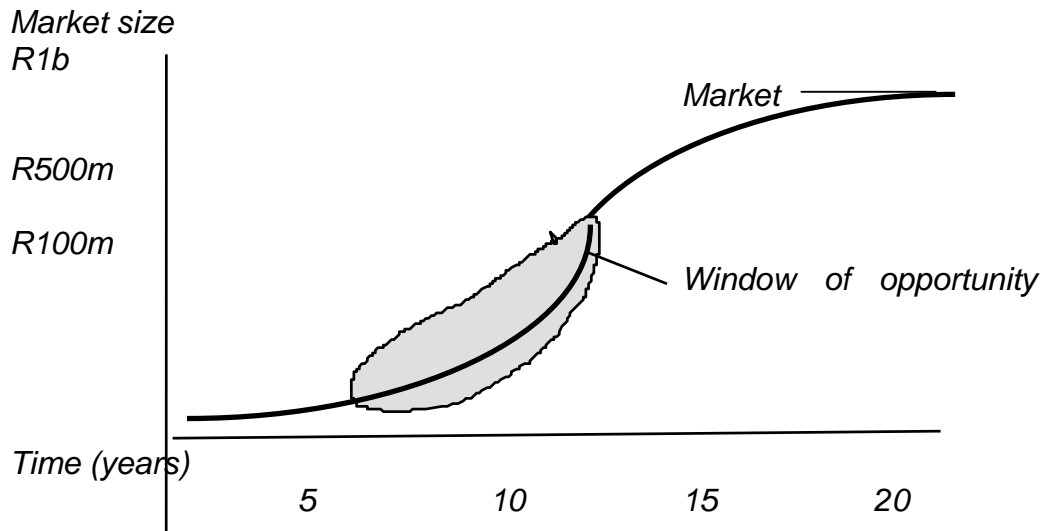
It is furthermore important to point out that opportunities are situational. This situationalism varies from being totally idiosyncratic or strange or unusual to being absolutely common and applicable or present in various markets, industries, products or services. It is then indeed the entrepreneur with credit value, intentionality, and creativity who exploits the opportunities that exist. It can be concluded from various research papers that the ideal entrepreneur per definition is an individual who develops a passion or obsession for the development and identification of opportunities in chaotic situations. With this quality in hand the successful entrepreneur continually distinguishes him/herself with regard to certain ideas or opportunities.

Dyer (1997:18) denotes that the successful entrepreneur is opportunity orientated. This behaviour is measured in as much as how he/she identifies new opportunities and formulates new ideas to make use of these opportunities. The development or transformation of these ideas in marketable or market-orientated products or services as well as the effective implementation of it are regarded as opportunities. The author also suggests that the whole process should be system orientated.

The new or entrepreneurial venture's system design must support the identification and development process and be able to simplify the management. According to the author this approach could hold long-term advantages. Hisrich and Peters (2002:39) regard the entrepreneur's total commitment to the identified opportunity as of the utmost importance.

The identification of opportunity as well as its in-depth analysis is the precursor for the creation of the suitable business plan (see Business skills (B/S), Chapter 2). To analyse an opportunity correctly Timmons (1999:84) presents the following graphic illustration:

**Figure 11: Analysis of opportunity**



(Source: As adapted from Timmons (1999:84))

Opportunities are per definition time limited. The frame work wherein the opportunity is present is called the window of opportunity or opportunity opening. The entrepreneur must be able to take hold of the opportunity using his/her idea. Figure 11 shows that with the growth of any market certain opportunities open up as time goes by. As the market becomes bigger and more established, opportunities that are more advantageous than earlier or later in the market growth cycle, will present themselves. The opportunity (window) therefore opens at a certain time and as growth increases it becomes satisfied, the opportunity possibilities decrease. The length of time that the market opportunity is “open” thus is of the utmost importance.



Hisrich and Peters (2002:41) add to this by regarding the window of opportunity as one wherein the true and perceived value of the opportunity must be determined as well as the risk and income that could result from it. The opportunity should also be placed in relation to the entrepreneur's personal skills and goals and an in-depth competitive-analysis surrounding the opportunity should be determined. They add that the "window" could be the most measurable determinant of risk and income. The risk reflects the market, competition, technology and the amount of capital needed. The aforementioned also forms the basis for income and reward. The authors point out that a large difference exists between the appearance and value of an opportunity analysis plan and the real business plan. The difference is of importance with regards to the fundamental role that the opportunity analysis plan has to play in the in-depth analysis of the opportunity as such. This plan also includes a descriptive analysis of the product or service, including an analysis of the entrepreneur and, if available, his/her team specifications in respect of all planned activities and resources that are needed to change the opportunity into a viable business. Finally, it is important to complete the financing aspects (first and second phase) in terms of the nature and amount needed.

With the physical analysis of the opportunity the following questioning frame work has to be present:

- Which market need has to be satisfied?
- What personal observation was completed to analyse the need?
- What social prerequisites are seen as underlying this need?
- What market research was done to describe the market need?
- Are the patent requirements seen as a part of the opportunity?
- Does noticeable competition exist in the market and how can the behaviour of the competition be best described?

- What does the international market and competition look like?
- What would the profitability be like in terms of the activity that it requires?

Sahlman and Stevenson (1991:36) mention that certain hurdles could arise within this window of opportunity. Certain strategies followed by competitors can hasten the closing of the window, product substitutes could be developed, technology may hold certain complications due to its turbulent nature, consumer preference can drastically change as well as the manufacturer's attitude. The authors suggest that these hurdles could easily be overcome or prevented by means of the implementation of cost-effective methods, distribution power, patent right, trade secrets and obvious product differentiation. Zimmerer et al. (1996:80-83) argues that an opportunity could be used in a positive way should the product or service be able to penetrate the market in a very short period of time. This is also the case where the technical risk is low and a well thought through pre-testing was done on the product and in the market. He concludes by mentioning that should the entrepreneur and his venture have the ability and resources to implement a new product strategy, the success rate seems to be much higher. In order to work analytically, successfully summarising opportunities correctly, synthesis of specific information is necessary. Information as required by the entrepreneur is normally complex.

Binks and Vale (1990:159) link the complex nature of information required by entrepreneurs to the complex nature of entrepreneurial decision-making. The information is firstly acquired on the question side. For instance market-evaluation, marketing requirements, competition, consumer preferences and secondly, on the supply side: Technological consciousness and knowledge ability, cost evaluation and well-

considered knowledge of the implication of the various scales that are applicable to market penetration and expansion.

Van Vuuren (1997) uses the following techniques with regard to the optimal use of:

### **3.7.1 A needs-orientated paradigm**

As was already discussed, every opportunity is a combination of the need for specific products, services or processes. This need can be approached directly or the ignorance about a product or a need in the consumer can be triggered by the release of a new product, service or process. The entrepreneur with successful training techniques could stimulate needs orientation. The author suggests that in the training situation the entrepreneur can, for instance, gather information about the needs of individuals or groups in his/her immediate social environment.

### **3.7.2 Changes**

Opportunities are usually to be found in non-consequential changing situations. These situations are mostly bound to the appearance of chaos and information that is reflexive and contradictory. During the training situation the entrepreneur must therefore be made aware that certain changes leading to chaos and the unusual could actually increase his/her achievement.

### **3.7.3 Change orientation**

In the previous excerpts emphasis was placed on the changing, risky and insecure environment that the entrepreneur finds himself in or will soon be in. Van Vuuren strongly emphasises the fact that

entrepreneurs should first and foremost be made aware that they have the ability to manage change effectively. Secondly, this requirement calls for the ability to handle opposition, to manage conflict as well as to have certain negotiation skills that, for instance, are necessary in the buying, selling and internal environment.

#### **3.7.4 Component charts and gaps**

Van Vuuren explains on a logical level that products, services and processes have certain components. He refers to the restaurant industry where general service and product components exist. The example of a hair salon can also be used here. It's not just about the product or hair-cut and the necessary client services, but other factors like electricity, rent, the design and composition of the interior, equipment and the creation of image all come into play. The opportunity lies in the identification and formulation of successful components within the venture in order to optimally satisfy consumer demand. This satisfaction must be in relation to the price and quality of the physical and/or service product. The successful way in which distribution takes place as well as the way that value is added to the whole process is also of some importance. The author adds that it is obvious that a shortage in the national supply could develop. With this it is suggested that the entrepreneur should develop a global perspective in order to overcome shortages of local products or to overcome the gaps by making use of national imports. It is also important to perceive entrepreneurship from an international or global managerial perspective and this leaves ample opportunity for continuous research into the field.

### **3.8 Training and creativity, innovation and opportunity finding in an entrepreneurial context**

One can conclude from the above that it is obvious that creativity or creative thoughts aim to achieve a so-called “newness”. De Bono (1996) continually stresses that successful creativity calls for certain skills that change primary concepts and perceptions. He highlights the fact that creativity is a logical process and should the individual accept and understand the process as logical, it will motivate him/her to take further creative action. This statement presents certain training possibilities for the entrepreneurial training environment.

Couger (1995:12-13) supports De Bono in the educability of individuals in creativity. He supports the statement with the reference to an analysis of 142 studies where the creativity of individuals increased markedly after a training intervention.

Carrier (1999:3) stated in her pioneering work that a necessity for new pedagogical paradigms exist in the field of teaching entrepreneurs the role of creativity, innovation and opportunity finding. This relevant statement fuelled the development of a new paradigm regarding the creativity, innovation and opportunity finding intervention in the field of entrepreneurship training. This paradigm and method is primarily based on the needs of entrepreneurship training in South Africa, with a significantly different training milieu and needs framework, compared to the typical Western or Eurocentric methods and views.

The need for training entrepreneurship in South Africa is a given fact without any further elaboration being needed, as elucidated in Chapters 1 and 2. Although unique in a fundamental sense, it is still evident that the pedagogical paradigms regarding creativity, innovation and

opportunity finding training are also lacking new approaches and successful outcomes. Carrier (1999:4) summarised the problematic situation and suggests that the following transformations should take place:

- Courses offered by training institutions that focus on training the traditional manager and not the entrepreneur.
- Lack of skills training for growth-oriented business (thus primarily opportunity driven) should receive attention.
- The lack of models addressing the creativity, innovation and opportunity finding issues directly, should form part of entrepreneurship training.
- Proper differentiation should be made between a business idea and an opportunity in a training context
- Less emphasis must be placed on the pre-entrepreneurial phase of actively seeking business opportunities, but rather an accentuation of feasibility and realistic market related opportunities.
- The total lack of tools, textbooks and approaches to cultivate creativity, innovation and opportunity finding must be addressed.
- Creativity, innovation opportunity finding and the contrasting stifling pedagogical paradigms in the teaching of business and entrepreneurship should be considered.
- Lecturing as a teaching method, is an approach that often reveals more about the teacher than about the subject taught.

Carrier's views are supported in much of the research conducted. Solomon and Fernald (1991:47) note that "much of the criticism focuses on lack of creativity and individual thinking required at both undergraduate and graduate levels". Plaschka and Welsch (1990:73) criticise the fact that many business schools follow a "product" approach rather than a "customer" approach to entrepreneurship education.

Carrier (1999) correctly indicates that far too few entrepreneurship training programmes focus on the pre-entrepreneurial phase (entrepreneurial processes). The core of this phase is centered in the identification of an opportunity as well as the generation of viable product/service ideas. She adds to this the lack of instruments, textbooks and approaches.

The author (Carrier 1999:8) uses the following techniques to address the problem directly:

- Combination methods:
  - Discovery matrix
  - Morphological analysis
- Analytical methods:
  - Value analysis
  - Characteristics lists
  - Scenario development
  - Lateral thinking
- Association methods:
  - Metaphors and analogue
  - Association/bi-association
  - Mental mapping
- Explorative methods
  - Brainstorming
  - Combined word recognition
- Dream methods
  - Creative visualization
  - Daydreaming

The primary aim of these techniques is to stimulate and use right-brain activities to create “new” ideas. This process is concluded with an opportunity-identification technique that places the ideas in a reality framework.

Dolan, in Van Vuuren (1997:2), however confirms that there is firm evidence indicating that entrepreneurs should rather be innovative than creative. Majaro (1988:27-30), on the other hand, verifies that there is a strong link between innovation and creativity. He argues that there is an obvious interaction between individual and environmental creativity, which together seem to be the power source of innovation.

Entrepreneurs and enterprises will gain tremendously where innovation is fed by absolute creative ideas and the processes involved with it. It is further reasoned that a large number of successes can be linked to the dualistic force of combined creativity and innovation. He suggests the following analogy: The entrepreneur will not be able to be innovative without a high level of creativity (innate or taught); this combination will ensure real success.

### **3.9 Conclusion**

Some researchers supported the fact that entrepreneurship education finds itself in a growth phase in the product life-cycle context. It is though not applicable to use the term “growth” without proper consensus on the content, method or even paradigms in the field. Notwithstanding the lack of consensus on paradigm in the inclusion and content of creativity, innovation and opportunity finding as entrepreneurial skills a holistic view on content development is necessary in the field of entrepreneurship training and development. To focus only on certain variables will not induce entrepreneurial performance effectively.



It is herewith again emphasised that creativity, innovation and opportunity finding form an integral part of the total entrepreneurship training model.

A primary limitation to this study evolves from the general lack of research at a global level regarding the training of the entrepreneurship learner in creativity, innovation and opportunity finding. An array of research interventions concentrate on methodology (in a training context) to increase “employee” creativity and innovation in the workplace, thus placing emphasis on “corporate” enhancement. Research in general fails therefore to note the significance of specific training interventions, models and methodology with regards to creativity, innovation and opportunity finding in an entrepreneurial context. This study endeavours to contribute to development in an entrepreneurial context.

## Chapter 4:           **The Creativity, innovation and opportunity finding training Model (CIO)**

*There is nothing more difficult to take in hand, more perilous to conduct, or more uncertain in its success, than to take the lead in the introduction of a new order of things -*

Machiavelli 1520

### **4.1 Introduction**

The University of Pretoria, South Africa, pioneered the field of Entrepreneurship training by introducing the first *Baccalaureus Commercii* (BCom) degree specialising in Entrepreneurship in Africa. The degree commenced in 1999 and operates on a full-time basis over a minimum time frame of three years. In spite of initial scepticism on the side of faculty members, the degree grew at an annual rate exceeding 150% in learner quantities. The growth figure is not only due to the current economic context but also is a result of a training model that focuses on the fundamental improvement of entrepreneurial performance.

The philosophy of the programme is based on the following multiplicative model (as discussed in Chapter 2):  **$E/P = M (E/S \times B/S)$** . The concepts contained in the training model are graphically illustrated as follows:

**Table 17: Concepts of the training model**

<b>Entrepreneurial Performance (E/P)</b>	<b>Performance motivation (M)</b>	<b>Entrepreneurial skills (E/S)</b>	<b>Business skills (B/S)</b>
<ul style="list-style-type: none"> <li>▪ Establishment of own business</li> </ul>	<ul style="list-style-type: none"> <li>▪ Performance motivation</li> </ul>	<ul style="list-style-type: none"> <li>▪ Risk propensity</li> </ul>	<ul style="list-style-type: none"> <li>▪ General management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Completion of first transactions</li> </ul>		<ul style="list-style-type: none"> <li>▪ <b><u>Creativity and innovation</u></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Marketing skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Growth in net value of business</li> </ul>		<ul style="list-style-type: none"> <li>▪ <b><u>Opportunity identification</u></b></li> </ul>	<ul style="list-style-type: none"> <li>▪ Legal skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Recruitment of employees</li> </ul>		<ul style="list-style-type: none"> <li>▪ Role models</li> </ul>	<ul style="list-style-type: none"> <li>▪ Operational skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing productivity levels</li> </ul>			<ul style="list-style-type: none"> <li>▪ Human resource management skills</li> </ul>
<ul style="list-style-type: none"> <li>▪ Increasing profitability</li> </ul>			<ul style="list-style-type: none"> <li>▪ Communication skills</li> </ul>
			<ul style="list-style-type: none"> <li>▪ Business plan</li> </ul>

(Source: Adapted from Antonites (2000:21))

The focus of this study is to illustrate specifically how three interrelated entrepreneurial skills namely creativity, innovation and opportunity finding is taught. The reason for this being the search for a CIO paradigm as urged by Carrier (1999). The training model for CIO forms part of a semester course, thus 60 (sixty) notional learning hours, and is conducted during the second year of study. The axiomatic outcome of the model is the development of a new product, service or process (innovation), as a result of creativity catalysation and based on feasible opportunities in the market or task environment. The following section will describe the CIO training model.

#### **4.2.1 The entrepreneurial creativity, innovation and opportunity finding training model (CIO)**

The developmental root of the model is a combination and integration of specific pedagogical training models and principles. Curriculum development was embedded on the theorem of Gibb (1993:11-34), who

distinguished between normal didactic methods of training and a more entrepreneurial approach.

**Table 18: Differentiation between “didactic” and “entrepreneurial” training methods**

<b>Didactic method</b>	<b>Enterprising method</b>
Learning from teacher only	Learning from each other
Passive role as listener	Learning by doing
Learning from written text	Learning from personal exchange and debate
Learning from “expert” frameworks of teacher	Learning by discovering (under guidance)
Learning from feedback from one key person (the teacher)	Learning from the reactions of many people
Learning in a well-organised, timetabled environment	Learning in flexible, informal environment
Learning without pressure of immediate goals	Learning under pressure to achieve goals
Copying from others discouraged	Learning by borrowing from others
Mistakes feared	Mistakes learned from
Learning by notes	Learning through problem solving

(Source: Adapted from Gibb (1993:13))

The total CIO teaching model is based on the “enterprising” principles above. This enterprising model is applied directly and is also endorsed by the fundamental characteristics of action learning, although a certain level of theoretical intervention takes place within the framework of creativity, innovation and opportunity finding in an entrepreneurial context.

Entrepreneurship as a subject is globally seen as an applied science and therefore requires a delivery mode that supports a more practical training approach. The CIO's educational framework and operational methodology is thus primarily based on a combination of the principles of action learning within an experiential learning framework, and will henceforth be discussed as background to the evolution of the CIO training model.

#### **4.2.2 Action learning**

Howell (1994:15) quotes Morgan's definition directly: "Action learning is both a concept and a form of action which aims to enhance the capacities of people in everyday situations to investigate, understand and, if they wish, to change those situations in an ongoing fashion, with a minimum of external help. Action learning is concerned with empowering people in the sense that they become critically conscious of their values, assumptions, actions, interdependencies, rights, and prerogatives so that they can act in a substantially rational way as active partners in producing their reality."

McGill and Beaty (1992:17) defined action learning as a process where the learner learns through experience by thinking through past events, seeking ideas that make sense of the event and help them to find new ways of behaving in similar situations in future.

Koo (1999:89) extracts the definition of Smith (1997) that emphasises the "responsible involvement" of the learner in the process of problem solving, in order to change his or her behaviour and actions accordingly. The author also states/provides the core elements of the following definitions: An approach that differentiates between doing something himself/herself, and basic theory (Newton and Wilkenson 1995); a

process where the learner learns to ask relevant questions when a risk situation exists, instead of processes in which the answers already occur (Keys 1994); "...the ability to search the unfamiliar, and inappropriate programmed knowledge may inhibit this... learners learn as they manage and they manage because they have learned – and go on learning." (Dilworth 1996); and "...a process of reflection and action, aimed at improving effectiveness of action where learning is an important outcome" (Bourner *et al* 1996). Howell adds, by definition, the role of action learning in creating an "interrelationship" between the learner and his/her environment in order to become "active partners in producing their reality".

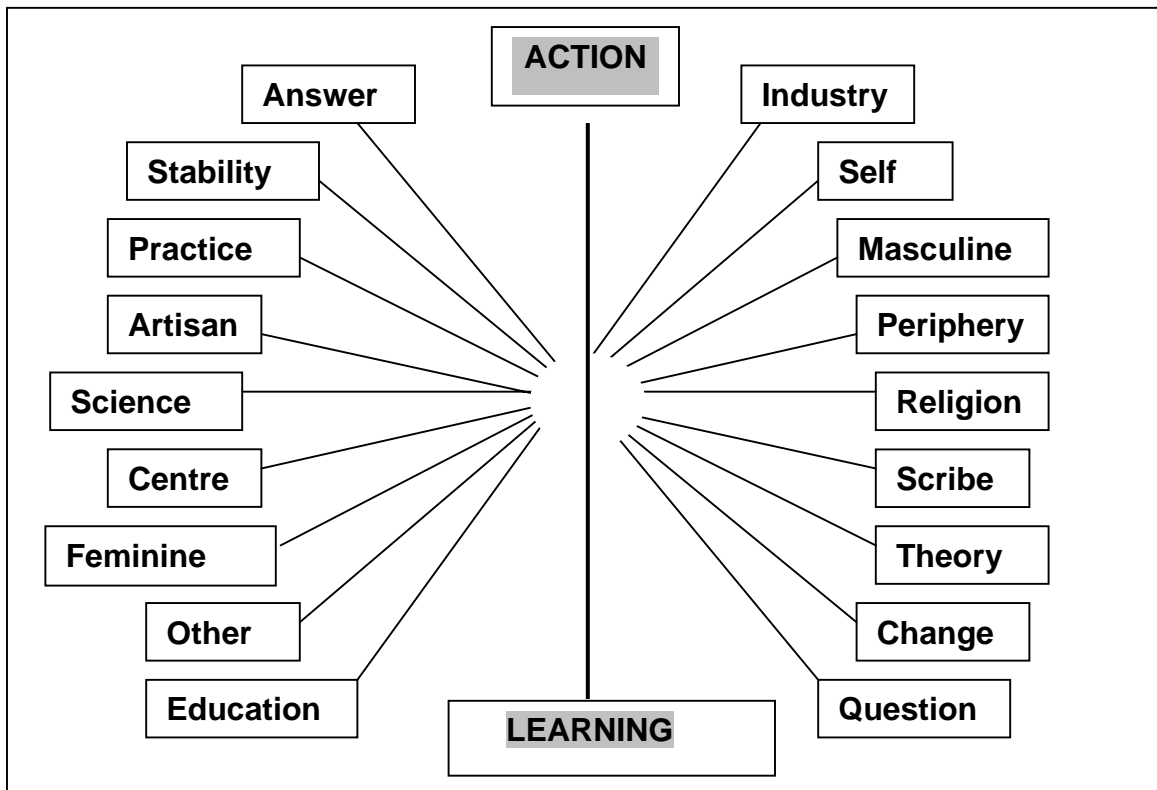
Smith (1998:246) located 900 articles written on the topic of "action learning" and refers to Revans as the pioneer in the field of action learning who started his research and application in the 1940s. Revans's work is stamped as a form of "exquisite simplicity" that represents enormous complexity. Leitch and Harrison (1999:92-93) cite Revans who distinguished between two interdependent learning variables namely P and Q. "P" portrays "programmed knowledge" that embraces facts, theories and existing models, which are normally integrative to conventional or traditional learning paradigms. The "Q" stands for "questioning insight" that resembles an alternative way of solving problems by means of questioning methods based on the existence of unknown solutions.

Revans (1987:19) categorises "P" learning as the traditional method (traditional instruction) by means of which occupations like engineers, surveyors, electricians, mechanics and other operators were educated in the past. "Q" learning suggests that the current state of affairs need to be questioned in an active mode of delivery. It also motivates the learner to question the programmed phase of learning. The equation  $L = P + Q$

assumes therefore that effective learning, in an experiential learning context, will take place in a combined (P + Q) effort. The equation states that “learning by doing” engages with theoretical knowledge as a fundamental platform.

Lessem in Pedler (1991), described the evolution of Revan’s work as the synthesis of the following variables, contained in the field of polarity:

**Figure 12: The field of polarity**



(Source: As adapted from Pedler (1991:21))

Pedler briefly describes the variables as follows:

- **Scribe and artisan: Mind and body**

Revans distinguished between the existence of “matter” (physical achievement) and “spirit” (conceptual attainment) in the development of the action learning paradigm, as important ingredients for development.

- **Education and industry: Ivory tower and colliery shaft**

The continuous gap created between industry and education in terms of relevance and synchronisation formed a critical part of his synthesising process. The traditional thought was that education is responsible for theoretical intervention and industry for the practical implementation. This occurrence was unacceptable and the two environments should be moulded into one by means of an action learning approach.

- **Self and others: Miners and teachers**

The transfer of skills (especially technical skills) can effectively take place by means of the participation of skilled individuals/employees in the learning of unskilled individuals. Emphasis is placed on problem situations encountered by the skilled during their learning process. Transferring the management or operational skills to solve comparable problems to the unskilled, formed a core element of action learning. (Revans applied these learning principles successfully in the mining industry.)



- **Centre and periphery: Industrial morale and size of unit**

Revans cites that "... it is the big organisations that suffers, for it is in the big organisations that the centre of decisions and the periphery of action face the greatest of mutual misunderstanding." The author indicated that smaller groups are much more effective in problem-solving situations while information is assimilated easier, thus providing a more purposeful learning process.

- **Science and religion: Thought and action**

The integrative nature of the analytical approach (science) and interpersonal relationships in the workplace played an important role in the development of his theory. Revans studied the differentiated values found in religions like: Christianity, Judaism, Buddhism, Master K'ung Ch'iu (Chinese), Bhavagad-Gita and Islam and applied some of the characteristics in an action learning framework. His work indicates that action learning integrates science (objective analysis) and religion (subjective commitment).

- **Action and learning: Changing system and self**

The author postulated that "knowledge" is the consequence of "action". The learner procures knowledge while participating in any form of "action". Learners therefore should in order to "answer their work-questions they must, at the same time, explore their self-questions". Training in an action learning format thus suggests that the learner needs to incorporate his own questioning process to solve problems, and not only the existing set of solutions or theory. Pedler quotes Revan directly to support the latter "knowledge is the consequence of action, and to know is the same as to do, or the

underlying structures of successful achievement, of learning, of intelligent counseling, and of what we call the scientific method, are logically identical.”

- **Stability and change: Today and tomorrow**

The author postulates that learning should take place at a higher pace than “changes” in the environment. He therefore assessed that a “system” can only change if the individual transforms him/herself. “Our ability to adapt to change with such readiness that we are seen to change may be defined as learning”, describes this opinion clearly. The capacity of learners to identify and assess change is as an unconditional element of action learning.

- **The signs of our times: Masculine and feminine**

Revans illustrated the difference between P (programmed knowledge) and Q (questioning insight) by means of a push-and-pull comparison, where the P represents a push factor (acquired theory through programmed learning) and Q a pull factor (action learning). The author directly quotes a metaphor that led to the foregoing, as compiled by Jantsch in the work Design and Evolution: “Where planning, the MASCULINE element, aims at stabilisation which in turn makes it possible to act out of power or focused energy; love, the FEMININE element, introduces the instabilities which elevate the plane of human action to ever new dynamic regimes, thereby ensuring the continuously renewed conditions for human creativity, for the life of human systems”.

Smith (1997:365) levels the criticism that Revans’ work supposed the relatively unimportant role of “P” – programmed knowledge in action

learning. Revans is stated in this regard: “In true action learning, it is not what a man already knows and tells that sharpens the countenance of his friend, but what he does not know and what his friend does not know either”. Smith pleads that “P” should form part of the process, especially when it can be related directly to the problem or issue to be solved by the learner. “P” can only be neglected if the learning process focuses merely on self-development. Robinson (2001:64-69) states that the integration of the traditional “didactic method” of training is supportive to action learning and shows empirical evidence in this regard. It thus provides a reason to integrate the theory of creativity, innovation and opportunity finding as part of the CIO training model.

Leitch and Harrison (1999:93) argue likewise that action learning is not necessarily a new paradigm in training, but rather a new and fresh approach. The authors observe the fact that the approach yields certain irregularities as stated by McLaughlin and Thorpe (1993):

- “Self-development” presupposes the fact that the learner can circumscribe his/her own learning needs. It is evident that guidance and direction is compulsory to achieve certain defining objectives, especially in the case of younger learners. The action learning process therefore supposed to provide specific structure for the learner, without affecting the “questioning insight” of the individual.
- “Theorists claim that there is no priori reason why a manager could not use the model to develop his/her manipulative techniques. However, they state that proponents of self-development techniques would argue that these tendencies are likely to be decreased rather than increased.”

- “Action learning encourages a desire to move on higher plains. Students who are thus challenged to take a broader view of the world may seek further enlightenment and ignore practical action.”
- “The fear that cognitive knowledge may be dismissed completely, thus impoverishing the action learning experience indicates that ” growth should thus continuously take place in the field of “P” and “Q”.

Koo (1999:90) adds to the above argument and cites Cusins (1996), who recapitulates the behavioural impediments of an action learning approach on a more practical level, by providing the following examples:

- The bully (exhibiting excessive threatening behaviour towards others)
- The blocker (repeatedly blocking other people’s ideas)
- The joker (continually using jokes to avoid real issues)
- The cop-out (excessive withdrawal from discussion, with implied disapproval)
- The rambler (talking on and on without getting to the point)

The author provides further evidence of other obstacles that may also occur:

- The action learning approach may be unsuccessful in cases where the learner is reluctant to participate in action.
- Action learning will not succeed where the environment only supports “teaching” and not “learning”.
- The approach is normally and logically ineffectual if the learner is not the nucleus of the learning process.

The application of the CIO training model, that resembled an action learning approach, showed extremely high correlation with the behavioural evidence as described in the foregoing.

Bourner and Frost (1996:23) placed the problematic conditions surrounding action learning in a higher education context (the environmental context of CIO implementation):

- Higher education institutions set specific assessment, certification, teaching and learning criteria. The assessment of experiential learning or “emerging” learning concepts still needs to be researched and validated.
- The learner’s principal objective is to obtain certification in order to obtain employment or further him/herself in the workplace. This fact hinders effective action learning processes.
- Higher education institutions require an “incremental” introduction of action learning principles that blend in with conventional “programmed learning” paradigms.
- The validation process of action learning programmes takes much more effort in order to be accepted in mainstream education.
- Facilitators need different skills than the normal teaching or “seminar” skills to facilitate the action learning process effectively.

The question arises in terms of why action learning is a beneficial learning process? O’ Hara et al. (1996:) mention the following advantages of action learning:

- “Learning to learn” – the learner equips him/herself with the skill to learn on a continuous basis (life-long learning)

- “Self-management of learning” – the learner assesses his/her own outcome or way of thought and actions as well as the learning process of other learners
- “Self-awareness” – learners specifically take part in group interaction processes and therefore become aware of their abilities to engage in group cohesiveness and achievement
- “Learning with and through others” – the social nature of learning is integral to the action learning process.

McGill and Beaty (1992:17-34) support the work of O’ Hara et al. and augments the following benefits:

- Learners learn to engage in a learning process that incorporates experience instead of just repeating previous patterns
- Action learning combines “the feeling of helping as much as receiving help – in the same session”
- The participating learners do not necessarily need to know each other in terms of group participation
- Action learning focuses on “real” problems and not quasi or made-up problem situations.

Leitch and Harrison (1999:95) acknowledge the effectiveness of management and entrepreneurship training, in the action learning context, by referring to Porter and McKibben (1988), Limerick and Moore (1991) and Harrison and Leitch (1994). Howell (1994) likewise provides empirical evidence in terms of actual and significant increases in work performance after the completion of an action learning process.

#### 4.2.3 The CIO training model

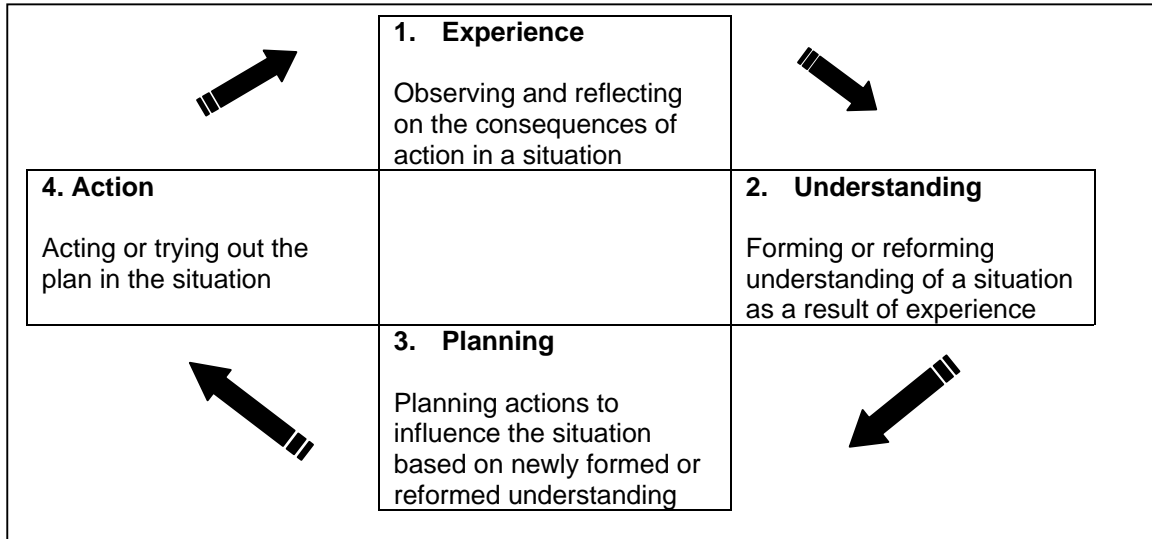
Harris et al. (2000:3) accentuate the argument of Gibb (1996) that entrepreneurship programmes should support the “know to” aspects more than the “know what” in terms of the learning process. Gibb also includes the fact that emphasis should be placed on the process rather than the content. The authors uphold the latter with the research done by Garavan O’ Cinneide (1994) and Vesper (1982). The CIO training model utilises action learning that embraces a process approach with an emphasis on the “know to” within the field of entrepreneurship.

The initial decision to make use of the action learning approach was based on the opinion of Cusins (1996), who claims that action learning is the result or holistic augmentation of the following dynamics:

- Experiential learning
- Creative problem solving
- Acquisition of relevant knowledge
- Co-learner group support.

Two main characteristics that are emphasised in the CIO training model are thinking through reflection and action, supported by experience. The entrepreneurship learner is not only supposed to be linked closer to industry as such, but also become part of the hard reality of the entrepreneurial or business environment. McGill and Beaty (1992:25) cite the model developed by Pedler et al. (1986), as a way of capturing the principles of action learning.

**Figure 13: Principles of action learning**



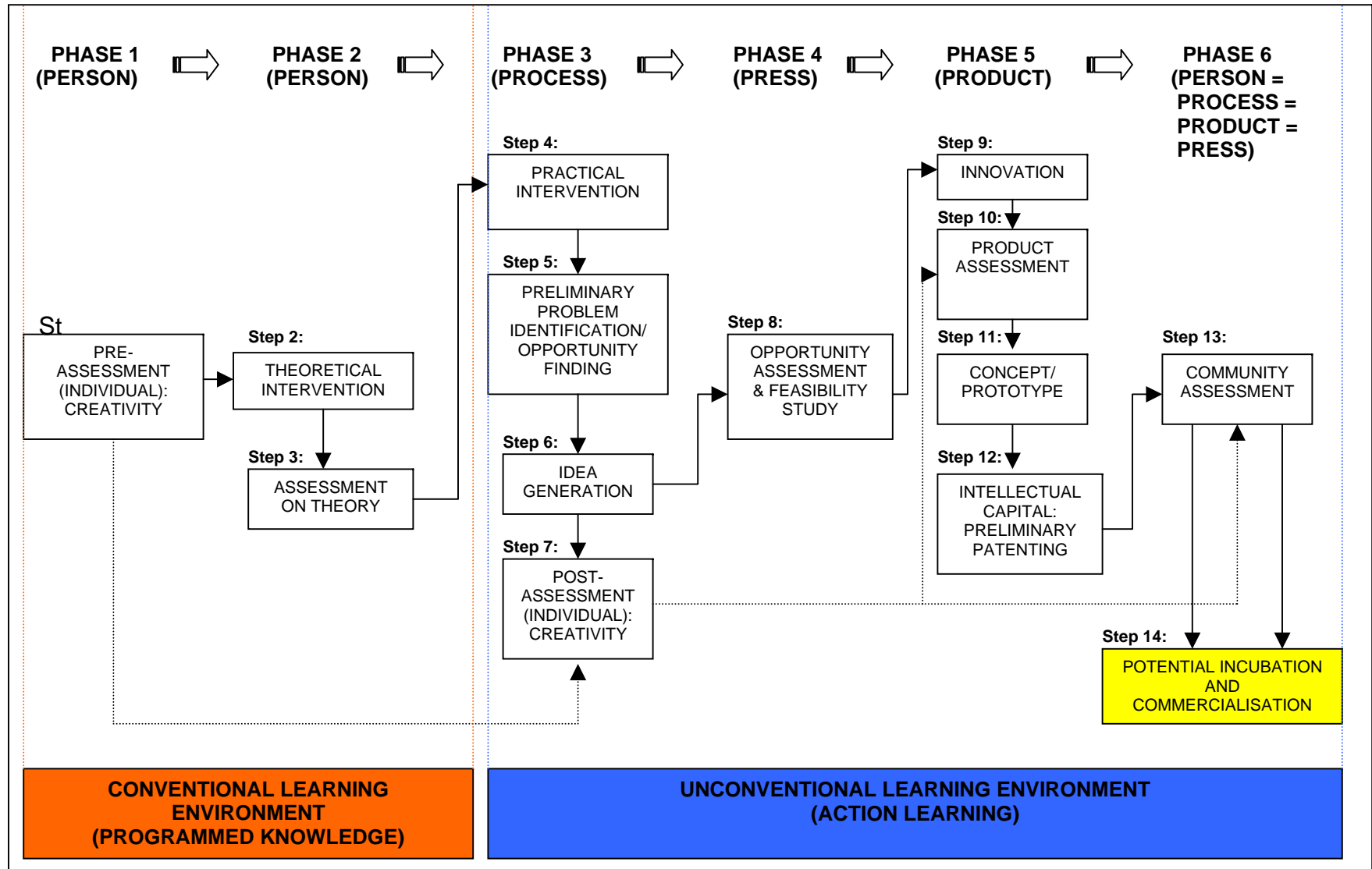
(Source: Adapted from McGill & Beaty (1992:27))

Pedler’s model served as a platform in the development of the CIO model. The action learning and training method is furthermore enhanced by the application of certain entrepreneurial methods of training and learning, which forms an integral part of action learning.

The following illustration offers a graphic lay-out of the CIO training model. A detailed explanation will ensue the latter.



Figure 14: The Creativity, Innovation and Opportunity finding training model



The Creativity, innovation and opportunity finding training model consists out of the following six consecutive phases, structured into 14 steps:

#### **1.2.3.5 Phase 1: The Person**

##### **Step 1: *Pre-assessment of creativity level***

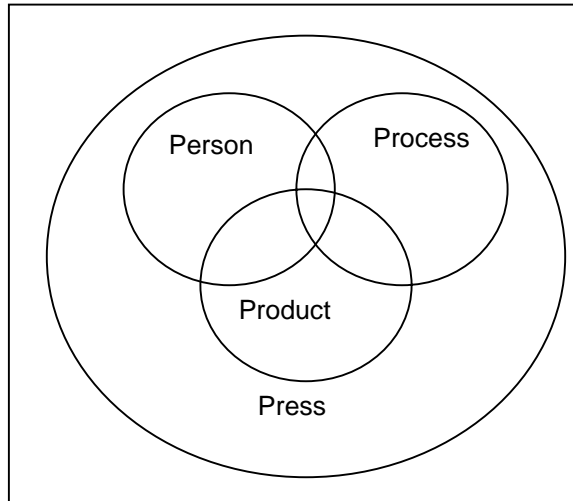
The learner assesses his or her own level of creativity before any training intervention is initiated. The questionnaire is developed by Williams (1999) and measures individual levels of creativity. The learners process and interpret their own questionnaire and the results are kept confidential and for his or her own benefit. A post-assessment is conducted in Step 7.

#### **2.2.3.5 Phase 2: The person**

##### **Step 2: *Theoretical intervention***

The following step in the training process entails the acquisition of the theory on creativity and innovation. The 1995 textbook of J.D. Couger. *Creative Problem Solving and Opportunity Finding*, by Thompson Publishing, forms the theoretical platform for this step. Theory on creativity and innovation is furthermore based on the interrelated 4P model of Couger (1995). The structure is illustrated as follows:

**Figure 15: Theoretical intervention**



(Source: Adapted from Couger (1995:5))

The content of the Couger model is summarised in the following format:

- **Person**

All the psychological aspects of creativity are discussed with the learner and also synthesised accordingly. It is firstly important to investigate into what it takes to develop creativity for the person. How does a creative person look and is it possible to develop creativity? Amabile (1999:5) firstly explains the “person” side of creativity in terms of expertise, which includes all the knowledge, experience and talent a person can use to apply in a certain situation. This expertise could be acquired through his/her educational background, training interventions and even by means of daily interaction with others. The second aspect is the motivational component of the creative “person”, which determines what the person will do and whether he/she will do it. The level of motivation could furthermore, in a certain sense, determine entrepreneurial

performance or success in the long run. Thirdly, creative-thinking skills, play an enormous role in the way the “person” will deal with a problem or idea and how he/she will associate unrelated components and combine them in a new or unique format. All these thinking skills are based on the principles of divergent thinking as compared to convergent thinking. The learner realises the difference between the latter on a theoretical level.

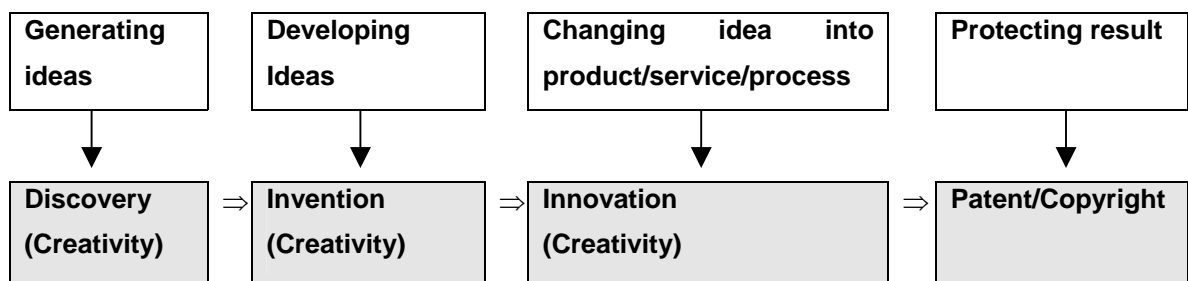
- **Process**

The creative process is assimilated by the learner and is based on the work of Nystrom (1979). The creative process generally follows these steps: Awareness and interest; Preparation; Incubation; Illumination (Insight) and Verification. Creativity techniques are introduced on a theoretical level only.

- **Product**

The learner learns that the new innovation or product is the direct result of the creative process mentioned above and therefore is a result of the creative-thinking process. The process as indicated by Couger (1995:18), indicates to the learner how creativity plays a catalysing role in the new product development process:

**Figure 16: Creativity as a catalyst**



(Source: Adapted from Couger (1995:18))

A critical differentiation is made between the terms creativity; discovery; invention and innovation. Practical examples of entrepreneurial innovations in the South African market environment, are used to illustrate this specific topic.

- **Press (environment)**

The learner is exposed to all the environmental barriers to creativity. Barriers are divided into perceptual, cultural, physical and psychological/Intellectual barriers. Specific emphasis is placed on the South African situation and context. Theory is also incorporated regarding the removal of these barriers.

Curriculum design

The curriculum design, in terms of the theoretical induction, is compiled and presented in the following format (as partly based on the textbook of Couger (1995). The learning content consists of the nine topics with accompanying learning outcomes:

**SECTION A: SYNOPSIS OF CREATIVITY**

**Topic 1: Introduction to creativity**

The learner is introduced to the world of creativity that will eventually lead to an innovation and new product development. Basic theoretical concepts are explored with an emphasis on secondary research and literature.

### Learning outcomes

The learner must be able to:

- Understand trainability in order to become more creative, or increase his or her level of creativity.
- Define the concept creativity by means of existing definitions and the creation of his or her own definition.
- Know the relationship between creativity and intelligence.
- Discuss the conditions for creative thinking.
- Identify with the different measures of creative thinking ability.
- Recognises the personality traits and qualities of creative thinkers.
- Be familiar with the activities and actions in order to improve personal creativity.
- Distinguish creativity from innovation and invention.
- Identify the myths about creativity.
- Discuss the nature of the major creative entrepreneurial breakthroughs at a global level.
- Briefly assess the basic cost effectiveness of creativity.

### **Topic 2: Concepts and cost-effectiveness of creativity**

The learner evaluates the structured and unstructured nature of creativity by means of specific creativity techniques that facilitate the process.

### Learning outcomes

The learner must be able to:

- Distinguish between structured and unstructured creativity.

- Understand the examples of structured creativity techniques.
- Illustrate the use of creativity techniques by means of differentiating between analytical and intuitive techniques.
- Comprehend and apply the Progressive abstraction technique.
- Comprehend and apply the Interrogatories (5ws/H) techniques.
- Comprehend and apply the Force field analysis technique.
- Comprehend and apply the Associations/Images technique.
- Comprehend and apply the Wishful thinking technique.
- Comprehend and apply the Analogy/Metaphor technique.
- Describe when and where to use the different techniques.

### **Topic 3: Removing the barriers to creativity**

The learner studies the existence of various blocks or obstacles that may prevent the individual from thinking and acting creatively.

Learning outcomes

The learner must be able to:

- Identify potential blocks to creativity.
- Discuss the role of perceptual blocks in creativity development.
- Discuss the role of emotional blocks in creativity development.
- Discuss the role of cultural blocks in creativity development in a South African context.
- Discuss the role of environmental blocks in creativity development, with specific reference to the entrepreneurial environment.
- Discuss the role of intellectual blocks in creativity development.
- Apprehend the concept “paradigm trap” and the role that certain paradigms play in creative thinking and decision making.

- Interpret the procedure for evaluating existing paradigms and developing new paradigms.
- Identify the principle causes of the loss of creativity.
- Conceive the different approaches for stimulating curiosity.
- Understand his/her style of creativity based on the Innovation Styles Profile ® developed by William Miller as adapted from Couger (1995:98)

**Topic 4: Creative problem-solving methodology**

The learners enables him/herself to determine how creative thinking can be used to solve problems in different situations, with specific emphasis on the entrepreneurial environment.

Learning outcomes

The learner must be able to:

- Distinguish among the problem solving theorem of Von Fange; Gregory; Bailey and Rossman.
- Understand the Osborn-Parnes creative problem-solving model.
- Describe the different phases of the Mandala of creativity as developed by Tatsuno.
- Illustrate the Isaksen/Treffinger CPS model that differentiates between divergent and convergent activities in creative problem solving.
- Briefly explicate the Couger Variant of the creative problem-solving model.
- Discuss the divergent and convergent quality of the creative problem- solving process.
- Comprehend the techniques to facilitate the divergent process.



**Topic 5: Creative versus critical thinking**

The topic covers all aspects relating to creative and critical thinking. The thought process forms the nucleus of the learning material.

Learning outcomes

The learner must be able to:

- Understand all the activities in the thinking and thought process.
- Briefly describe the physiological aspects of thinking.
- Give a concise description of the properties of memory.
- Identify ways to improve memory and thinking ability.
- Explain the characteristics of critical thinking.
- Apply the holistic thinking approach in a business context.

**SECTION B: CREATIVE PROBLEM SOLVING AND OPPORTUNITY FINDING**

**Topic 6: Problem definition and opportunity delineation**

The topic covers an application of creative thinking and problem-solving theory for the learner. The topic focuses on an essential component of problem solving, namely defining the problem as part of the identification of opportunities in the market place. The problem situation is correlated with the opportunity assessment process.

Learning outcomes

The learner must be able to:

- Understand the three-stage approach based on the Gap Analysis.
- Define the role of the problem statement as part of the whole process.
- Use creativity techniques to facilitate problem definition with specific reference to the Progressive Abstraction, Boundary examination, 5Ws/H and Wishful thinking techniques.
- Practically apply the theory in identifying and defining specific problem situations.

**Topic 7: Compiling relevant information about the problem/opportunity**

Data and information analysis form a critical part of the problem solving or opportunity finding process. The learner needs to identify and understand all the processes and procedures in gathering relevant data for sound decision making and problem solving.

Learning outcomes

The learner must be able to:

- Comprehend the reasons for data-gathering activities and the complete fact finding process.
- Describe the steps in the data gathering process.
- Identify all the possible sources of data.
- Understand the role of critical thinking in the data gathering and analysis phase.

- Apply the appropriate questioning and listening techniques in gathering data.
- Apply specific techniques in supporting the data gathering and analysis phase, with reference to the Lotus Blossom and Bug list techniques.

**Topic 8: Idea generation**

After the problem definition and data and information analysis process, the learner needs to generate ideas to solve the problem effectively or to exploit the identified opportunity.

Learning outcomes

The learner must be able to:

- Be on familiar terms with the feasibility characteristics of an opportunity.
- Discuss the different stages in the creative process: Preparation, incubation, illumination and verification.
- Understand the role of persistence and humour in idea generation.
- Apply techniques in facilitating creativity with specific reference to the: Brainstorming; Analogies/Metaphors; Interrogatories (5Ws/H); Problem reversal; Wishful thinking and Wildest idea techniques.
- Combine the different techniques to attain the multiplier effect.
- Comprehend the evaluation and prioritising of ideas.
- Differentiate between “dialogue” and the “discussion” in idea evaluation.
- Determine the idea evaluation criteria.
- Understand the different techniques for evaluating ideas, with specific reference to Advantage/Disadvantage; Battelle; Castle;

Creative evaluation; Decision balance sheet; Idea advocate; Panel consensus, Reverse brainstorming; Sticking dots and Combination techniques.

- Discuss the risk assessment phase of choosing the most suitable idea.
- Apply techniques for idea evaluation and prioritisation, with specific reference to the Force field analysis and Decomposable matrices techniques.
- Evaluate the creativity of products and services.

### **Topic 9: Developing an implementation plan**

The learner has selected the most suitable idea to solve the problem or exploit the opportunity. The learner therefore develops a implementation plan in terms of eventually commercialising the unique product, service or process in line with the identified opportunity.

Learning outcomes

The learner must be able to:

- Develop an acceptance planning process.
- Understand the specific forms of intellectual property and the protection procedure.
- Apply the techniques relating to the facilitation of the action plan, with specific reference to the Problem reversal and Disjointed incrementalism techniques.
- Assess the potential resistance to change.
- Develop an action plan.

### **Step 3: Assessment on theoretical knowledge**

A formal assessment of theory follows the completion of the theoretical intervention. It takes place in a normal test format which is focused on the theory of creativity (see addendum for a test example).

The first two phases are conducted in a conventional learning environment (e.g. the classical classroom situation). The “P” (“programmed knowledge”) as part of Revans’s (1987) calculation ( $L = P + Q$ ) is therefore introduced in these two phases. The following four phases represents the “Q” (“questioning insight”) as part of the action learning paradigm and training model. These phases are implemented in an unconventional learning environment (e.g. outside of the classical classroom situation).

#### **4.2.3.3 Phase 3: The creative process**

##### **Step 4: *Practical introduction***

The actual practical creativity training process starts at this point in time. The learner obtained basic knowledge of creativity and innovation and the application thereof now commences. The first action taken is to remove the myths to creativity and allow the learner realise the impact of creativity.

The myths of creativity are analysed by De Bono (1996) and can be summarised under the following headings: Creativity is an innate skill and cannot be acquired by means of training; You need to be a rebel to be seen as creative; Artists are the only creative beings; You need to be “crazy” before creativity will kick in; Intelligence and creativity; All new products were accidental discoveries.

All the learners are assured - by means of De Bono's research - that each and every one of them have creative potential and that it is possible to develop and increase their levels of creativity. Critical studies done on the removal of the myths of creativity as conducted by Torrance (1995), are also added.

The physical environment in which the classes are presented is not conventional, they thus fall outside the standard academic environment and wherever the learner feels more creative and relaxed. Venues vary from restaurants, to private guesthouses the zoo, nature reserves and even on sports grounds.

The practical creative process starts with the "roots of creativity" sessions. These sessions include highly practical interventions that link the learner to constructs that are normally not inclusive to the business-learner's particular field of interest:

- Music
- Fine art
- Poetry
- Sculpturing.

It is vehemently stressed that the learners should realise their creative potential at this stage.

***Step 5: Preliminary problem identification/opportunity finding***

All the creativity techniques obtained in theory are applied in a real-life situation or context. The interventions are based on problem-solving issues related to the entrepreneurial context. The following techniques are applied: Random input; Problem reversal; 5Ws/H; Association

techniques; Discontinuity principles; Force field analysis; Wishful thinking and Analogy/Metaphor techniques. Learners start to identify general and specific problem situations in the market environment.

***Step 6: Idea generation***

The learner goes through an intensive idea generating process. This process is highly exhausting and unrelated objects are used to generate different purposes, uses and utilities. The opportunity finding process starts to evolve and the learner is introduced to industry related issues and problems on the surface. Idea generating skills are then utilised to identify and analyse opportunities in general. Specific scanning techniques are also introduced at this level. It is important to note that the processes above include individual and group development. The success indication of one of the groups is for example the generation of 120 uses for a paper clip in less than 20 minutes! During this stage the learners start to recognise what branches of industry tend to look attractive for business opportunities, based on various assessment techniques. Personal and group- related exploration, in terms of industry and opportunity assessment, takes place and an in-depth analysis of these opportunities forms part of the process.

***Step 7: Individual assessment***

The learner measures his/her level of creativity again by means of the same questionnaire (see step 1). The process is still confidential and individual. The learners can analyse their own improvement. Personal motivation seems to increase at this stage.

#### **4.2.3.4 Phase 4: The Press (environment)**

##### **Step 8: *The Opportunity assessment and feasibility study***

The learner is continuously aware of the fact that the fundamental outcome of the course is the development of a new product or service or process. After the completion of the creativity process, a new phase starts where opportunity assessment is emphasised even more. It is of the utmost importance that the learners apply the different areas of construct knowledge they have gained, thus idea versus opportunity.

The assessment of opportunities takes place and the learner can choose any branch of industry that falls in his or her field of interest. A final critical industrial analysis (related to a due diligence process) follows and feasible opportunities in these industries are chosen. More specific industrial evaluations follow and all the general traits and trends in the chosen industry must be studied. After this session the learner must decide whether the opportunities are real-time opportunities.

The learner now steps into an incubation period, where he or she generates ideas to solve the problem in the industry and the need as derived from the opportunity analysis. Role models in the chosen industry can also play an enormous role at this stage (the learner is prompted to interview these role models). The entrepreneurship group normally operates on an individual basis, but entrepreneurial teams with less than three members are permitted. The incubation period stretches over a period of two weeks and the pressure strategy is applied here (see Gibbs' model). Emphasis is placed on *uniqueness* and *new* idea generation. The learner is furthermore exposed to the requirements of investors and or financing entities in terms of creating a realistic background to the development of the "feasible-new". The latter is included due to the fact that certain entrepreneurship learners tend to



develop an “idea-anxiety” frame of mind, which evolves into unrealistic concept development.

#### **4.2.3.5 Phase 5: The product**

##### ***Step 9: The innovation process***

After the incubation period the process of innovation starts. The learner transforms his or her unique idea into a product or service or process. The latter must be directly in line with the opportunity as identified. It is not compulsory to create a physical product, but concept development must take place up and till the prototype phase.

##### ***Step 10: Concept/prototype***

A physical example or prototype of the innovation is developed, if time permits. The majority of the learners developed their concepts on paper and the physical production potential (as part of feasibility) is also assessed, in terms of the development of tangible products. In terms of the development of intangibles or services, the learner should create an example of the service.

##### ***Step 11: Product Assessment (The Innovator ©)***

After completing the prototype, the learner or entrepreneurial teams' product market feasibility is assessed by means of The Innovator ©, a tool developed to enable innovators to assess the likely commercial success of their ideas and inventions. This tool also helps the learner to identify weaknesses and matters still needing attention as they proceed through the innovation process (Williams 1999). The measurement instrument includes the following evaluations: Effects on society

(legality; safety; environmental impact; societal impact); Business risk (technical/functional feasibility; production feasibility; stage of development; development cost; payback period; profitability; marketing research; research and development); Analysis of demand (potential market; product life cycle; potential sales; likely trend in demand; stability of demand; potential for product-line expansion); Market acceptance (learning; need; dependence; visibility); and Competitive advantage (appearance; function; durability; price; existing competition; new competition and protection). The *Innovator* © served as the measurement instrument to provide empirical evidence for this study (see Chapter 5 and 6)

**Step 12: Preliminary patents**

The learner applies for a preliminary patent if applicable and/or at the wish of the learner. It is furthermore important to note that the learners should undergo the patenting process themselves and therefore learn about the process and assure protection.

**4.2.3.6 Phase 6: Final assessment (an integration of the 4P model)**

**Step 13: Community assessment**

To add more realism to the process, an open community assessment is undertaken (instead of the conventional “examination on paper” evaluation methodology). The assessment community includes the future role players in the commercialisation process of the product:

- Financing institutions
- Venture capitalists

- Academics
- Industry specific specialists
- Successful entrepreneurs
- A large sample of potential customers (open invitation) and specific customers relations with the different market assessments.

The learner introduces his or her product or service or process to the community by means of a formal presentation. The community assessment's results are added to the test on theory and form the final mark of the module. The learner now has the opportunity to develop his or her product, conduct proper market research (an item omitted due to time constraints) and even commercialise the product.

#### ***Step 14: Potential incubation and commercialisation***

This step does not form part of the formal training model, but potential products are developed (whether in conceptual or final phase). The potential entrepreneur can now move into a formal incubator to further the whole production process or venture out on its own. The formulation of a proper business plan (in line with investor and/or financing requirements) forms part of the following module of the second year of study and the product, as developed to date, serves as the core element of the plan.

#### **4.3 Conclusion**

The CIO training model must be seen in the light of the fact that firstly it is an integrated module in a formal entrepreneurship training program and secondly an experiential intervention that served as a platform for further development. It is, however evident that the outcome of the model proved to be successful in terms of the research results

presented in the following chapters. The module on creativity, innovation and opportunity finding is but only a concept of the broader entrepreneurial skills construct and does not spell indefinite entrepreneurial performance or success. The foregoing is still highly dependent on the individual's perseverance and the application of various other skill sets.

## **Chapter 5: Research procedures and methodology**

### **5.1 Introduction:**

The study was concerned with the assessment of the likely success of a creativity, innovation and opportunity finding training intervention, within an entrepreneurship training context. The CIO training model (Creativity, Innovation and Opportunity finding) was applied to the curriculum of the second year of *Baccalaureus Commercii* (BCom) degree specialising in Entrepreneurship, at the University of Pretoria, South Africa. The timeframe ranges from 1999 to 2002. An action learning approach was applied within an experiential learning context. Consequently, the action learning set is defined as being applicable to second-year entrepreneurship learners. The training model forms part of a programme that focuses on the acquisition of entrepreneurial and business skills. The study has an experimental design that constitutes the following (as discussed in Chapter 1). Zickmund (1997:307) defines the experimental design as one that exists as a method based on the manipulation of a variable with the sequential testing of causal relationships among variables.

The experimental design consists of an independent variable that serves as the manipulated entity. The experimental design of the study involves the treatment or the independent variable as the CIO training model with an experimental group (entrepreneurship learners) and a control group (business learners not specialising in entrepreneurship). The first experimental group formed part of the specialised degree in Entrepreneurship (B.Com) and received the CIO treatment as a compulsory subject in the second year of study. The size of the group is 22. The second experimental group is B.Com students specialising in various commercial directions that took the subject (CIO) as an elective.

The size of the group is 69. The Control group were students chosen from different fields of commerce, whom do not take any entrepreneurship subjects, but developed new products as part of a marketing elective. The size of the group is 50.

The *Innovator* © (see Addendum), a measurement instrument that tests the likely success of new products, services or processes, serves as the dependent variable or criteria for judgement. The test units are firstly the learners specialising in entrepreneurship and secondly learners not specialising in entrepreneurship but in general business studies.

The treatment (independent variable) was conducted in a controlled research environment (non-laboratory), therefore striving towards a “constancy of conditions”. Extraneous variables were limited as far as possible but interference was present. The main interference was non-class attendance, whereby some learners missed out on the process approach as part of the action learning paradigm applied in this programme.

### **5.1.1 Internal validity**

Zickmund (1997:308) categorises six different types of extraneous variables that may influence internal validity negatively: History, maturation, testing, instrumentation, selection and mortality. Internal validity may, to a limited extent, be affected due to the unknown background or experience (history) of the learners (in both cases: treated and control groups). The experimental treatment (training programme) can therefore not be seen as the sole cause of observed changes in the dependent variable. The age distribution of learners ranged between 19 to 22 years and can to a great extent be generalised

as limited business experience. Hence it provides relatively high evidence of internal validity.

### 5.1.2 External validity

The measurement instrument (*Innovator* ©) has been developed on the basis of the needs of the external business environment. It therefore measures the likely commercial success of new products, services or processes (innovations) in the market place. The external validity of the results tends to be positive, while research results can be generalised to the external environment.

### 5.1.3 Classification of experimental design

This study is based on the Campbell and Stanley symbolisation, in which:

**X = exposure of a group to an experimental treatment**

**O = observation or measurement of the dependent variable**

The classification of this study is a “**static group design**”. A static group design implies that an “after-only” design is present. The treated group is measured after treatment (the CIO training programme) took place and the control group is measured without a treatment intervention (the CIO training programme). The experimental symbolisation can be illustrated as follows:

<b>Experimental group:</b>	<b>X</b>	<b>O<sub>1</sub></b>
<b>Control group:</b>		<b>O<sub>2</sub></b>
Where the effect of the experimental treatment equals $O_2 - O_1$		

## **5.2 Statistical Analysis**

This section discusses the statistical techniques used to analyze the data and obtain the research results. Two basic types of statistical analysis were performed in the current study namely descriptive and inferential statistics.

### **5.2.1 Descriptive statistics**

Salkind (2001:150) describes descriptive statistics as the characteristics of the sample. The descriptive statistics used were frequencies, means and standard deviations.

Frequencies refer to the actual amount or percentage of responses to a certain question. These are presented in the current study by means of bar charts or tables. The arithmetic mean, measuring the central tendency, was used to determine the average response of respondents towards a test.

### **5.2.2 Inferential statistics**

Cozby (1985:142) indicates that inferential statistics allow researchers to make inferences about the true differences in the population on the basis of the sample data. An integral concept in inferential statistics is statistical significance and this is discussed firstly.

### **5.2.3 Statistical Significance**

Hypotheses cannot be tested directly on the population (due to constraints of time and money and the population being too big in most cases). Differences, which appear to exist between groups (in the



sample data), may in reality (in the real population) not exist (Salkind 2000:170).

Cooper and Emory (1995:434) states that the statistical significance of a result is the probability that the observed relationship (i.e. between variables) or a difference (i.e., between means) in a sample occurred by pure chance ("luck of the draw"), and that in the population from which the sample was drawn, no such relationship or differences exist. This probability is computed for each statistical test and expressed as a p-value.

The higher the p-value, the less one can believe that the observed relation between variables in the sample is a reliable indicator of the relation between the respective variables in the population. Therefore we would in fact like a smaller p-value.

The most commonly used p-values are 0.01 or 0.05. The chosen value p- depends on the researcher and the level of risk, of accepting a difference where in fact there is none (Type 1/Type 2 error).

Cooper and Emory (1995:434) argue that statistical significance is an important research tool, but should not be confused with scientific significant findings. The authors also distinguish between statistical significance and practical significance.

A result may be statistically significant yet whether it is important to the scientific community will depend on the nature of the variable being studied. Practical significance of a treatment effect depends on factors other than statistical significance such as cost and validity of the study. Even if the treatment effect is significant it may be too costly to implement and has therefore no practical significance.

#### 5.2.4 t-test

DeFusco et al. (2001:327) shows that the appropriate inferential test when comparing two means obtained from different groups of subjects is a t-test for independent groups. The t for independent groups is defined as the difference between the sample means divided by the standard error of the mean difference

The authors indicate furthermore that the p-level reported with a t-test represents the probability of error involved in accepting our research hypothesis about the existence of a difference. The null hypothesis is that of no difference between the two categories of observations (corresponding to the groups).

Some researchers suggest that if the difference is in the predicted direction, you can consider only one half (one "tail") of the probability distribution and thus divide the standard p-level reported with a t-test (a "two-tailed" probability) by two. Others, however, suggest that you should always report the standard, two-tailed t-test probability.

As the two-tailed p-values in the current study is all highly significant (below 0.001), it was not considered necessary to divide them even though the differences are in the expected direction.

#### 5.2.5 ANOVA

In general, the purpose of analysis of variance (ANOVA) is to test for significant differences between means. ANOVA tests the null hypothesis that all the population means are equal:

$$H_0: \mu_1 = \mu_2 = \dots = \mu_a$$

Two estimates are derived. One estimate (called the Mean Square Error or "MSE" for short) is based on the variances within the samples and the other (Mean Square between or "MSB" for short) is based on the variance of the sample means.

([http://davidmlane.com/hyperstat/intro\\_ANOVA.html](http://davidmlane.com/hyperstat/intro_ANOVA.html))

In ANOVA we can test each factor while controlling all others; this is actually the reason why ANOVA is more statistically powerful (i.e., we need fewer observations to find a significant effect) than the simple t-test.

When the F-test in the one-way analysis of variance proves significant at the 5% level of significance, it shows that there are statistically significant differences. Yet often this simply says that 3 or more groups are different with respect to their mean scores and to understand between which of the 3 groups the differences actually lies, a so-called post-hoc test procedure is applied to test which pair-wise group difference are significant. The procedure used in the present study is the Bonferroni.

### **5.2.6 Reliability and Validity**

Salkind (2000:105) states that reliability and validity is the hallmarks of good measurement. Reliability and validity is a researcher's first line of defence against spurious and incorrect conclusions. Reliability is when a test measures the same thing more than once and results in the same outcome.

The present study calculated the Cronbach Alpha coefficient as a measure of the internal consistency reliability of each of these scales.

Cronbach's alpha measures how well a set of items (or variables) measures a single unidimensional latent construct. When data have a multidimensional structure, Cronbach's alpha will usually be low. (<http://www.ats.ucla.edu/stat/spss/faq/alpha.html>)

Alpha coefficient ranges in value from 0 to 1 and may be used to describe the reliability of factors extracted from dichotomous and/or multi-point formatted questionnaires or scales.

The more items there are in a scale designed to measure a particular concept, the more reliable the measurement instrument will be.

The alpha is calculated as follows:

$$\alpha = \frac{N \cdot \bar{r}}{1 + (N - 1) \cdot \bar{r}}$$

The higher the Alpha is, the more reliable the test. There is not a generally agreed cut-off. Usually 0.7 and above is acceptable (Nunnally 1978). It is a common misconception that if the Alpha is low, it must be a bad test. Actually the test may measure several attributes/dimensions rather than one and thus the Cronbach Alpha is deflated.

(<http://www.ats.ucla.edu/stat/spss/faq/alpha.html>)

### 5.2.7 Effect sizes

The effect size tells you something very different from the p-value. A result that is statistically significant is not necessarily particularly important as judged by the magnitude of the effect, a highly significant result should therefore not automatically be interpreted as reflecting large effects (Rosnow and Rosenthal 1996:276). Sometimes also a

significant effect might be missed as the result failed to be significant (a Type 2 error). The effect size is also not dependent on the sample size, where the significance p-value is linked to the size of the sample.

Many indices of effect size have been formulated, each test corresponding with a separate index or formula. As the effect size measure the strength of a result/relationship, Rosnow and Rosenthal (1996) explains that the product moment  $r$  (correlation) is a good index of effect size.

The following guideline to the interpretation of the size are set by the Authors of “Conceptual introduction to power and effect size” :

Test	Small	Medium	Large
t-test (d)	0.2	0.5	0.8
Correlation r	0.1	0.3	0.5
Chi-square (e)	0.05	0.1	0.2

Four of the commonly used measures of effect size in ANOVA are:

- Eta squared,  $\eta^2$
- partial Eta squared,  $\eta^2_p$
- omega squared,  $w^2$
- the Intraclass correlation,  $rl$

In the current study eta squared ( $\eta^2$ ) was calculated by the program SPSS as part of an ANOVA process.

$\eta^2$  varies from 0 to 1 the bigger the number the greater effect (just like a correlation coefficient).

$\eta^2$  is the proportion of the total variance in the dependent variable that is associated with a particular effect.

The calculation is:

$$\eta^2 = \frac{SS_{school}}{SS_{total}}$$

### 5.2.8 Discriminant analysis

Discriminant function analysis is applied to determine which variables discriminate between two or more naturally occurring groups. For example, an educational researcher may want to investigate which variables discriminate between high school graduates who decide (1) to go to college, (2) to attend a trade or professional school, or (3) to seek no further training or education. For that purpose the researcher could collect data on numerous variables prior to students' graduation. After graduation, most students will naturally fall into one of the three categories. *Discriminant Analysis* could then be used to determine which variable(s) are the best predictors of students' subsequent educational choice.

The groups in this study are obviously not naturally occurring, therefore the one group is manipulated into what is now their results. If one obtains predictors, it is acquired for people that already know/have the knowledge that the experimental group has after the intervention/training.

## **Chapter 6: Analysis and discussion of results**

### **6.1 Introduction**

The purpose of the current chapter is to present the empirical research results. The aim of the empirical section of the research was primarily to establish whether the intervention (CIO training model) had a significant effect on the likely commercial success of an innovation, as measured by *The Innovator* ©. The two treated groups were measured against a control group without the necessary intervention undergone.

The *first* section will endow with a demographic profile of the respondents, comparing the experimental and control groups.

The *second* section converse the formation of certain “factors” on which the control and experimental groups will be compared. The reliability of each factor will be elaborated upon in this section.

The *third* section compares the control and experimental groups on these factors (as tested in the *Innovator* © - see Addendum), and establishes if statistically the experimental groups differ from the control group.

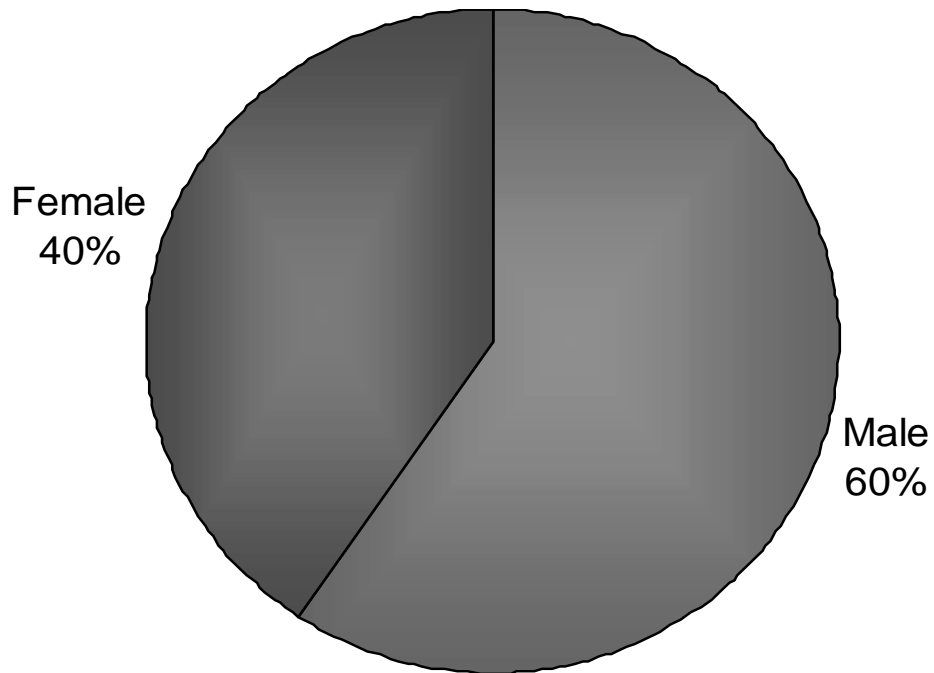
The *first* section also provides descriptive information on each question allowing for more qualitative and in-depth interpretation.

## 6.2 Demographic profile of the sample

Blanche and Durrheim (1999:95) states that one of the most important conditions for experimental research is that the participants who receive one level of the independent variable are equivalent in all ways to those who receive to other levels of the independent variable. In other words the control group and the experimental groups must exhibit the same demographic characteristics.

The gender composition of the total sample, and that of the control and experimental groups, is given below.

**Figure 17 Gender composition of the sample**





**Table 19 Gender composition of the control and experimental groups**

	Group 1		Group 2		Group 3	
	Frequency	Percent	Frequency	Percent	Frequency	Percent
Male	13	59.09	45	65.22	26	52
Female	9	40.91	24	34.78	24	48
Total	22	100	69	100	50	100

No significant difference exist between the three groups in terms of their gender composition (Chi-square = 2.106; p = 0.349)

The average age of each group is given below in Table 6.2.

**Table 20 Average age of respondents in the control and experimental groups**

	N	Minimum	Maximum	Mean	Std. Deviation	F	Sig.
1	22	20	22	20.55	0.67	3.21	0.043
2	69	19	23	21.26	1.04		
3	50	19	31	21.50	2.11		

A post hoc Bonferoni test has shown that group 3 is significantly older on average than group 1. Group 3 is a diverse group in terms of age, with ages varying to a large extent (large standard deviation). The oldest respondent being 31 years while in the other groups the oldest respondent is 22 to 23, contributes to this group having the highest average age. Although the control group is slightly older on average, age is not considered a nuisance variable that needs to be controlled as age does not really correlate with the scores on the factors.

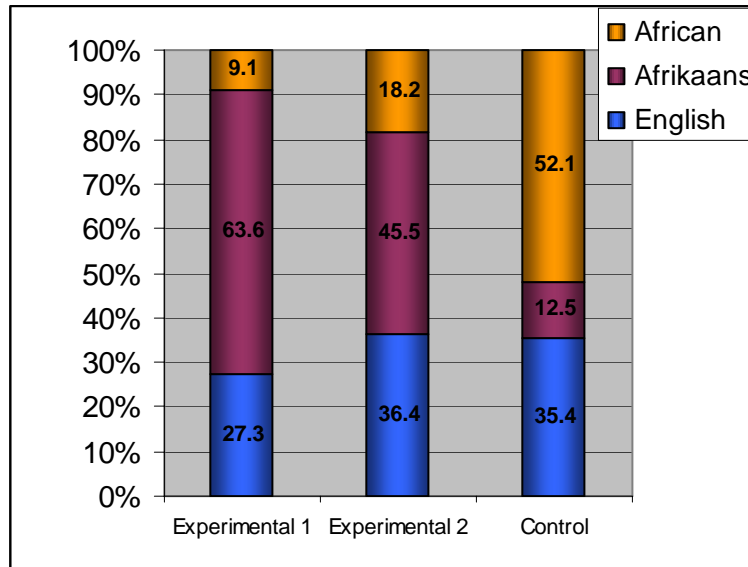
The home language of the total groups is provided below in Table 6.3.

**Table 21 Home language of respondents ( n = 141)**

<b>Language</b>	<b>Frequency</b>	<b>Percentage</b>
English	47	33.3
Sepedi	10	7.1
Northern-Sotho	7	5.0
Tswana	5	3.5
Afrikaans	50	35.5
French	1	.7
Siswati	1	.7
Xhosa	3	2.1
South-Sotho	6	4.3
Zulu	4	2.8
Isendebele	1	.7
Chinese	3	2.1
Venda	2	1.4
German	1	.7

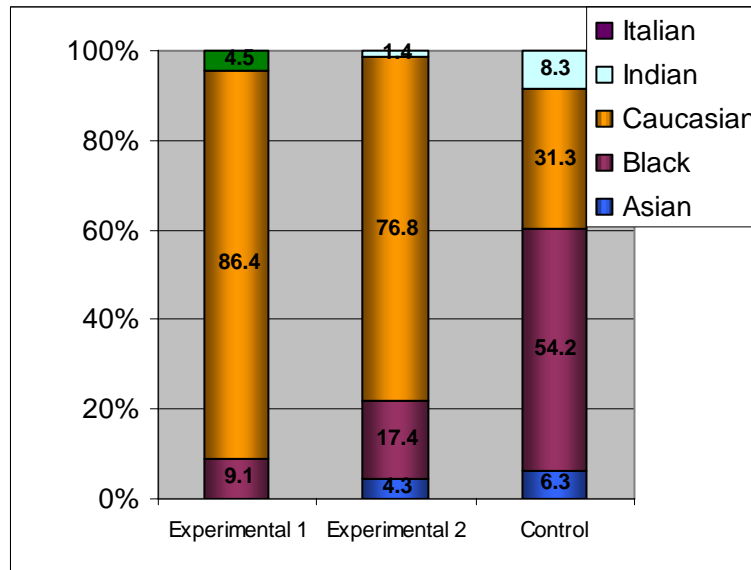
With the aim of comparison between the three groups, the language groups were combined into 4 groups; Afrikaans, English and African and Other. The languages German, Chinese and French (Other) were excluded from any analysis as they are, even combined, too small to facilitate stable statistics.

**Figure 18 Home language for the different groups (total n = 136)**



The experimental 1 and 2 show very similar language profiles, yet the control group has a notably higher amount of respondents speaking African languages. This difference is statistically significant (Chi-square = 39.92 ; p = 0.000). This profile is reflected in the race composition and there are significant differences between the three groups in terms of race (Chi-Square = 28.42 p = 0.000). Caucasian is described race group of European descent.

**Figure 19 Race composition of the test groups (n = 139)**



The degrees for which respondents were enrolled for is given below in table 6.4. The test groups do differ greatly in this regard, as it was part of the experiment to create two experimental groups based on their choice of degree.

**Table 22 Degree enrolled for (n =108)**

Qualification	Frequency	Percent
B.Com – Informatics	19	17.59
B.Com – Financial management	3	2.78
B.Com – Business management	22	20.37
Diploma – Business administration	2	1.85
B.Com – Own Choice	15	13.89
BA - Social work	6	5.56

B.Com – Marketing	9	8.33
B.Com - Economics	2	1.85
B.Com - Human resource management	1	0.93
Diploma - Pharmacy management	1	0.93
B.Com - Communication management	2	1.85
B.Com - Tourism	3	2.78
BSc - Engineering	2	1.85
B.Com – Entrepreneurship	20	18.52
B.A. – Publishing	1	0.93

The year of study also differ between the groups, with the Experimental 1 group consisting all of second year students (enrolled for the full time B.Com Entrepreneurship) while the other two groups are mostly third and fourth year students (Experimental group 2 – CIO module by choice; Control group – No CIO intervention).

**Table 23 Year of study of the test groups (n = 140)**

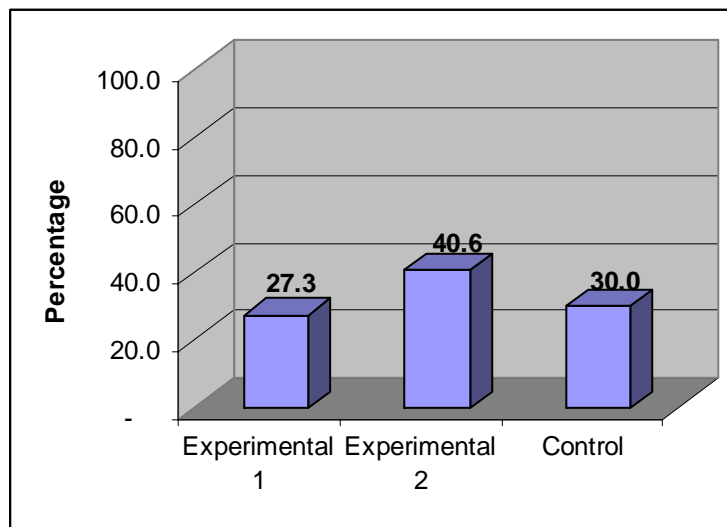
	Experimental 1		Experimental 2		Control	
	Frequency	%	Frequency	%	Frequency	%
2nd year	22	100	3	4.40	0	0
3rd year			58	85.29	38	76
4th year			6	8.82	11	22
5th year			1	1.47	1	2

**Table 24 Current entrepreneurial ventures ( n = 49)**

	<b>Frequency</b>	<b>Percent</b>
Art	4	8.16
IT	6	12.24
Telecommunication	2	4.08
Funeral service	1	2.04
Retail	16	32.65
Service	10	20.41
Tourism	2	4.08
Clothing	2	4.08
Medical	2	4.08
Other	1	2.04
Entertainment	2	4.08
Sport	1	2.04

49 respondents have one or more entrepreneurial venture. The figure below gives an indication of the extent to which each of the test groups undertakes entrepreneurial ventures.

**Figure 20 Extent of entrepreneurial activity (n = 49)**



### **6.3 Factor creation and reliability**

The factors were created on the basis of a theoretical framework. Each of the suggested factors was subjected to an item analysis as part of establishing the internal reliability. The factors were: Effects on society (legality; safety; environmental impact and societal impact); Business risk (technical/functional feasibility; production feasibility; stage of development; development cost; payback period; profitability; marketing research; research and development); Analysis of demand (potential market; product life cycle; potential sales; likely trend in market; stability of demand and potential product-line expansion); Market acceptance (learning; need; dependence; visibility; promotion, distribution and after-sale service) and Competitive advantage (appearance; function; durability; price; existing competition; new competition and protection).

#### **6.3.1 Item analysis**

The Cronbach's alpha for each factor was calculated. Each item's contribution to that Alpha is shown by indicating what the Alpha of the factor will be if that question is left out of the factor. If the Alpha increases by a large margin, when leaving out the question, to the discretion of the researcher, it is decided to leave that question out of any further analysis.

The item analysis for the first factor, Effect on society, is given below in Table 25 for full descriptions of the questions see the questionnaire in *Addendum A*.

**Table 25 Item analysis for the factor: *Effect on Society***

Question number	Question description	Alpha if item deleted
1	Legality	.7232
2	Safety	.7117
3	Environmental impact	.7118
4	Societal impact	.7201
<b>Cronbach Alpha for the factor = 0.7712</b>		

The factor “Effect on Society” shows a high internal reliability of 0.77. None of the questions would, by their exclusion, increase the reliability and all the questions were therefore used to create the final factor.

A factor is created by obtaining the mean scores over all the questions in the item.

**Table 26 Item analysis for the factor: *Business Risk***

Question number	Question description	Alpha if item deleted
5	Technical/functional feasibility	.8477
6	Production feasibility	.8493
7	Stage of development	.8402
8	Development cost	.8475
9	Payback period	.8528
10	Profitability	.8682
11	Marketing research	.8515
12	Research and development	.8515
<b>Cronbach Alpha for the factor = 0.867</b>		



A particularly high internal reliability is seen for the factor “Business Risk”, with all the items contributing to the reliability.

**Table 27 Item analysis for the factor: *Analysis of demand***

<b>Question number</b>	<b>Question description</b>	<b>Alpha if item deleted</b>
13	Potential market	.7838
14	Product life cycle	.8047
15	Potential sales	.7888
16	Likely trend in market	.7835
17	Stability of demand	.8105
18	Potential product-line expansion	.7945
<b>Cronbach Alpha for the factor = 0 .822</b>		

Once again a very high internal reliability was obtained for the factor “Analysis of demand”. None of the items were excluded, as all contribute well to the overall alpha.

**Table 28 Item analysis for the factor: *Market Acceptance***

<b>Question number</b>	<b>Question description</b>	<b>Alpha if item deleted</b>
19	Learning	.6776
20	Need	.7024
21	Dependence	.7650
22	Visibility	.7234
23	Promotion	.6942
24	Distribution	.7076
25	After-sale service	.6828

**Cronbach Alpha for the factor = 0.707**

The factor “Market Acceptance” obtained a slightly lower, yet still acceptably high, internal reliability consistency value of 0.704. All the items once again work well towards the final alpha and they were all included in the final factor.

**Table 29 Item analysis for the factor: *Competitive Advantage***

<b>Question number</b>	<b>Question description</b>	<b>Alpha if item deleted</b>
26	Appearance	.7499
27	Function	.7337
28	Durability	.7494
29	Price	.8117
30	Existing competition	.7655
31	New competition	.7881
32	Protection	.8003
<b>Cronbach Alpha for the factor = 0.7712</b>		

The internal validity of the factor “Competitive Advantage” may possibly be improved from an already high value of 0.77 to a value of 0.81 by the exclusion of the item “Price”. The Cronbach alpha of 0.77 is considered high and a good indicator of internal reliability. It is decided to include the item in the final analysis.

As a summary on the reliability of the questionnaire it can be said that all the factors created show high internal reliability consistency, and all items contribute fairly well to each factor.

The Chi – square is also presented to indicated the nominal variables with significant differences

**Table 30: Chi-square test for differences between the three test groups in terms of gender**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	2.1	2	0.349
Likelihood Ratio	2.1	2	0.349
Linear-by-Linear Association	0.841	1	0.359
N of Valid Cases	141		

**Table 31: Chi-square test for differences between the three test groups in terms of home language (3 main groups)**

	Value	df	Asymp. Sig. (2-sided)
Pearson Chi-Square	28.4	4	0.000
Likelihood Ratio	29.8	4	0.000
Linear-by-Linear Association	4.4	1	0.035
N of Valid Cases	136		

**6.4 Comparing the test groups on the factors of the likely commercial success of an innovation (*The Innovator* ©)**

In Chapter 5 (Research procedures and methodology), the importance of controlling for nuisance variables were discussed.

In section 6.2, the demographic composition of the sample, it was observed that the three test groups are equal in terms of gender composition. Gender would therefore not be a nuisance variable, yet the groups did differ with regard to language and race compositions.

For a variable to present a sufficiently large problem to be considered a nuisance variable, it should also show a relationship with the test variables (in the present study the factors).

Table 32 below presents the ANOVA results, comparing the language groups in terms of the *The Innovator* © factors. Only the three main language groups were used for this ANOVA.

**Table 32 Comparing the language groups in terms of the factors**

	Sum of Squares	df	Mean		Sig.
			Square	F	
Effect on Society	4.65	2	2.32	3.52	0.033
Business Risk	3.74	2	1.87	2.74	0.068
Analysis of Demand	4.78	2	2.39	3.53	0.032
Market Acceptance	2.23	2	1.11	2.45	0.090
Competitive Advantage	6.05	2	3.02	6.02	0.003

It is in terms of the factors Effect on Society, Analysis of Demand and Competitive Advantage where there are significant differences between

the three language groups in terms of their scores on *The Innovator* © factors.

The Bonferroni post-hoc test found that the differences are between the African and the Afrikaans, and the African and the English speakers. The Afrikaans and English speakers tend to obtain higher scores on these factors than the African speakers.

As the control groups has a high percentage African speaking respondents, relative to the two experimental groups, this may influence any differences found in between the control and experimental groups and language should be considered a nuisance variable.

The three groups also differed in terms of racial composition, with the control group being more racially diverse.

Table 33 below provides the results of a comparison of the African and Caucasian race groups in terms of *The Innovator* © factors. Only these groups are compared as the other race groups are too small in numbers.

**Table 33 Comparing the race groups African and Caucasian in terms of *The Innovator* © factors**

	Sum of Squares	df	Mean Square	F	Sig.
Effect on Society	5.79	1	5.79	9.80	0.002
Business Risk	4.06	1	4.06	6.31	0.013
Analysis of Demand	5.95	1	5.95	9.04	0.003
Market Acceptance	2.30	1	2.30	4.83	0.030
Competitive Advantage	5.57	1	5.57	10.98	0.001

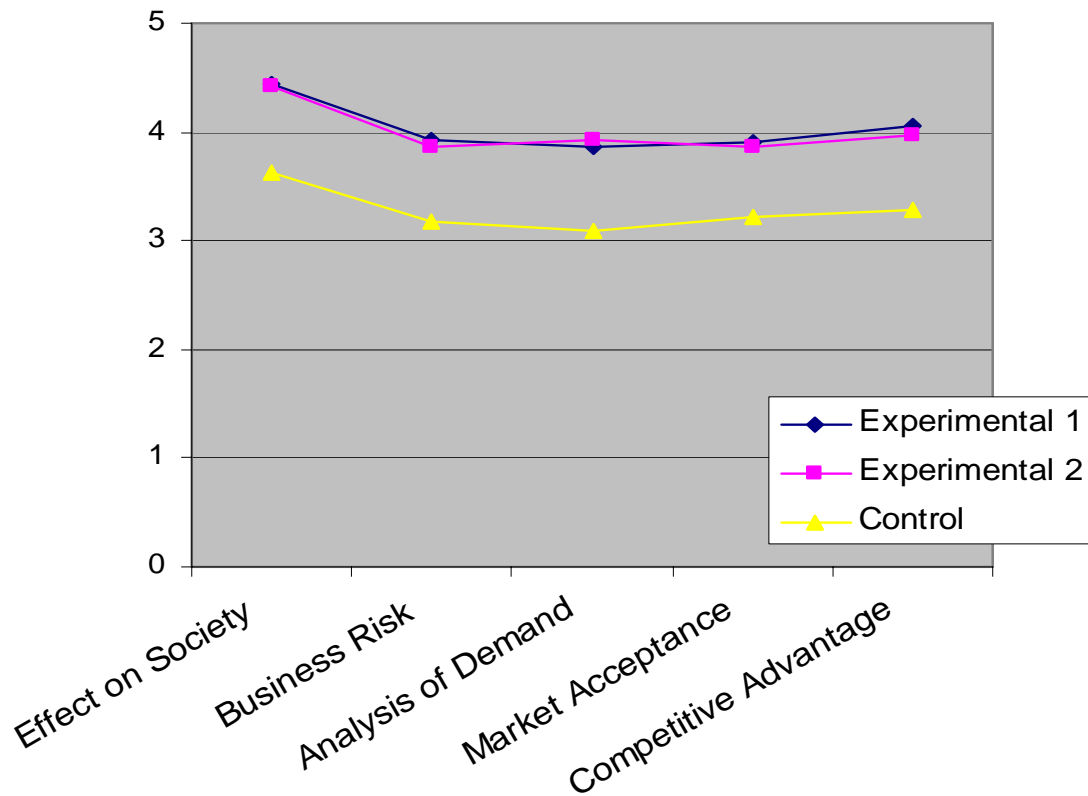
All the factors show significant differences between the two groups at the 0.05 level of significance.

The Caucasian race group scored consistently higher on all the factors. As the experimental group mostly consisted of Caucasian respondents and the control group had a large percentage African respondents, this may lead to an artificial difference between the experimental and control group, i.e. not due to the experimental effect.

Race is therefore considered a nuisance factor that will be controlled for when comparing the experimental and control groups.

A graphic plot of the mean scores on each of the factors gives an indication of the difference between the groups

**Figure 21 Mean scores of the three groups on *The Innovator* © factors**



It is clear from the figure above that the control group scored much lower on all the factors than the two experimental groups. Experimental group 1 and Experimental group 2 appear very close to one another.

The table below indicates that there are indeed significant differences between the control and experimental groups. The variables “language” and “race” were controlled for in the ANOVA analysis.

**Table 34 Comparison of the three test groups on *The Innovator* © factors – ANOVA**

	Sum of Squares	df	Mean Square	F	Sig.
Effect on Society	13.9	2	7.0	14.5	0.000
Business Risk	12.1	2	6.0	11.4	0.000
Analysis of Demand	12.8	2	6.4	11.5	0.000
Market Acceptance	10.3	2	5.1	13.3	0.000
Competitive Advantage	11.5	2	5.8	13.6	0.000

All factors show a significant difference between the factors. To identify between which of the three groups the differences are, a post hoc Bonferroni test was done. An alternative method, to aid in interpretation is to conduct a t-test between each of the groups. The results are given below in Table 35.

**Table 35 Size of the effect: Eta Squared**

	<b>Eta</b>	<b>Eta Squared</b>
Effect on Society	0.47	0.222
Business Risk	0.42	0.174
Analysis of Demand	0.48	0.226
Market Acceptance	0.43	0.189
Competitive Advantage	0.47	0.219

The factors where the effect, difference between the experimental groups and control group, is the most significantly found in the **Effect on Society, Analysis of Demand** and **Competitive Advantage** factors.

All the factors show relatively high effect sizes. The difference between the groups is not only significant but also practically large.

**Table 36 Comparison of the three test groups on *The Innovator* © factors – Independent t-test**

	Groups 1 and 2		Groups 1 and 3		Groups 2 and 3	
	<b>t</b>	<b>p-value</b>	<b>T</b>	<b>p-value</b>	<b>t</b>	<b>p-value</b>
Effect on Society	0.13	0.894	3.54	0.001	5.61	0.000
Business Risk	0.44	0.659	3.27	0.002	4.83	0.000
Analysis of Demand	-0.53	0.598	3.51	0.001	5.92	0.000
Market Acceptance	0.22	0.826	3.38	0.001	5.03	0.000
Competitive Advantage	0.77	0.446	3.72	0.000	5.52	0.000

Between groups 1 and 2 no real difference is seen, but between both groups 1 and 3 and between 2 and 3 there are significant differences.



## 6.5 Discriminant analysis

To confirm the results of the ANOVA, a discriminant analysis was executed as well. It was previously found that no significant differences exist between experimental groups 1 and 2. Some differences do appear to exist between the experimental groups and the control group however. In order to explore these differences further, it was decided to join the two experimental groups and compare them to the control group on the five factors, using a stepwise discriminant procedure.

**Table 37 Descriptive statistics of factors**

Group Statistics					
Dependant variable		Mean	Std. Deviation	Valid N (listwise)	
				Unweighted	Weighted
Experimental	Effect on Society	4.4313	.47444	91	91.000
	Business Risk	3.8846	.55286	91	91.000
	Analysis of Demand	3.9139	.58656	91	91.000
	Market Acceptance	3.8001	.44013	91	91.000
	Competitive Advantage	3.9950	.44489	91	91.000
Control	Effect on Society	3.6276	1.04473	49	49.000
	Business Risk	3.1913	1.02022	49	49.000
	Analysis of Demand	3.0952	.95682	49	49.000
	Market Acceptance	3.1905	.84465	49	49.000
	Competitive Advantage	3.2891	.90366	49	49.000
Total	Effect on Society	4.1500	.81895	140	140.000
	Business Risk	3.6420	.81699	140	140.000
	Analysis of Demand	3.6274	.83216	140	140.000
	Market Acceptance	3.5867	.67598	140	140.000
	Competitive Advantage	3.7480	.72411	140	140.000

In the ANOVA table below, the smaller the Wilks's lambda, the more important the independent variable to the discriminant function. Wilks's lambda is significant by the F test for all variables.

**Table 38: Tests of Equality of Group Means**

	Wilks' Lambda	F	df1	df2	Sig.
GROUPA	.779	39.086	1	138	.000
GROUPB	.835	27.270	1	138	.000
GROUPC	.778	39.326	1	138	.000
GROUPD	.814	31.609	1	138	.000
GROUPE	.782	38.418	1	138	.000

All the factors are important in the table above. In the Table of Correlations below it is however clear that high inter-correlations exists between the 5 factors so that a stepwise procedure would not include them all, and was therefore not included in this analysis.

**Table 39: Pooled Within-Groups Matrices (Covariance and correlation)**

		Effect on Society	Business Risk	Analysis of Demand	Market Acceptance	Competitive Advantage
<b>Covariance</b>	Effect on Society	.526	.322	.313	.238	.255
	Business Risk	.322	.561	.252	.310	.250
	Analysis of Demand	.313	.252	.543	.238	.283
	Market Acceptance	.238	.310	.238	.374	.265
	Competitive Advantage	.255	.250	.283	.265	.413

<b>Correlation</b>	Effect on Society	1.000	.592	.585	.536	.548
	Business Risk	.592	1.000	.457	.675	.519
	Analysis of Demand	.585	.457	1.000	.527	.598
	Market Acceptance	.536	.675	.527	1.000	.675
	Competitive Advantage	.548	.519	.598	.675	1.000
a The covariance matrix has 138 degrees of freedom.						

With regards to the prediction of group membership, table 40 classified the results as follows:

**Table 40: Classification results**

Classification Results(a)					
		Group	Predicted Group Membership		Total
			Exp.	Control	
Original	Count	Exp.	87	4	91
		Control	28	22	50
	%	Exp.	95.6	4.4	100.0
		Control	56.0	44.0	100.0
a 77.3% of original grouped cases correctly classified.					

It may be concluded that the differences between the experimental and control group can be effectively described in terms of factors a and c.

## Chapter 7: Summary and recommendations

*“Defining and understanding the concepts of creativity has always posed a challenge. Its measurement has eluded our schooling and therefor neglected, as a most integral skill needed for our future survival. Creative assessment is not necessarily an attribute of individuals, but of social systems making judgement calls about trends, individuals and, as can be expected, the creative product itself. It is a combination of complex functions, capacities and tendencies of which the social world can extract and create value from these novel products.”*

Botha (1999)

### 7.1 Introduction

The above quote is a summarised explanation of the world of creativity. An emphasis is provided on the nature of creativity as “complex” and even more strongly a construct with an elusive quality within an educational context. This argument provides evidence to the strenuous attempt to explore, develop and test the effect of creativity in an education and training framework, as endeavoured in this study. An even more complex platform is added, namely entrepreneurship. Both these fields create unique challenges. The challenge of developing a training model that integrates creativity, innovation and opportunity finding within an entrepreneurial context, was achieved and tested.

A facilitator in the inception phase of study was the pioneering work of Carrier (1999) as mentioned in Chapter 3. The author’s identification of

deficiencies in the field of entrepreneurship training, with a focus on creativity, innovation and opportunity finding, needs a definite repetition:

- Courses offered by training institutions focused on training the traditional manager and not the entrepreneur
- Lack of skills training for growth-oriented business (thus primarily opportunity driven)
- The lack of models addressing the creativity, innovation and opportunity finding issues directly, as part of entrepreneurship training
- Proper differentiation between a business idea and an opportunity, in a training context
- Less emphasis on the pre-entrepreneurial phase of actively seeking business opportunities, but rather an accentuation on feasibility and realistic market related opportunities
- Total lack of tools, textbooks and approaches to cultivate creativity, innovation and opportunity finding
- Creativity, innovation and opportunity finding stifling pedagogical paradigms in teaching business and entrepreneurship
- Lecturing as a teaching method, an approach that often reveals more about the teacher than about the subject taught

The development of the CIO training model was catalysed by the above, and the outcome, namely a novel product, formed the result thereof. An endeavour to address these issues directly served as the primary objective. An integrated procedural approach was structured and applied as follows:

- a. Formulation and development of the CIO training model (a secondary research process with a fundamental focal point on the field of entrepreneurship and best practices)

- b. Implementation of the model in an action learning context within a certain timeframe
- c. Testing the likely commercial success of the novel outcomes or innovations by means of the *Innovator* ©

## 7.2 Summary and findings of theory

### 7.2.1 Chapter 2

The first chapter on theory sets the scene for entrepreneurship education within a South-African context. Relevant sources were employed to ascertain the different elements of entrepreneurship education. The construct entrepreneurship is defined and conceptualised with an emphasis on true entrepreneurship with creativity, innovation and opportunity finding as differentiating entrepreneurial skills. A brief historical background of entrepreneurship is likewise illustrated. An accepted definition for entrepreneurship is compiled based on the work of Cornwall & Perlman (1990:4), Van Praag (1996:3), Burch (1986:4), Mare (1996:3), Drucker (1985:25); Hisrich & Peters (1998:9) and Kuratko & Hodgets (1998:31), although still a challenge in certain schools of thought.

The chapter furthermore portrays a secondary aggregation of research within the field of entrepreneurship. The fragmented nature of research in this field is highlighted. Research in general is divided into three different categories: *firstly* the entrepreneur, his/her actions and qualities, *secondly*, the entrepreneurial process and, *thirdly* the factors involved in increasing the promotion of the development of entrepreneurs and entrepreneurial activity. This study forms part of the developmental category.

A fourth part of the chapter focused on the training of entrepreneurs. The trainability of entrepreneurs is accepted as a given in this study as supported by Gibb (1985:3), Hisrich & Peters (1998:19) Kuratko & Hodgetts (1998:10) Rosa & McAlpine (1992:64), Van Vuuren (1997:1) and Welsch (1993:14) as well as McClelland (1969:1) and Winter (1964:19). The dynamic multiplication training model:  $E/P = f [M(E/S \times B/S)]$  is seen as the basis of curriculum development and explained in the context of the entrepreneurial process and this study. *Entrepreneurial performance (E/P)*, performance motivation (M) entrepreneurial (E/S) and business skills (B/S) form the core constructs in the formula and received an elaborated effort of clarification. A subsection provides evidence on entrepreneurship as a subject and the development of entrepreneurship as a discipline is elucidated upon.

### 7.2.2 Chapter 3

The nucleus of this study, creativity innovation and opportunity finding provided the content of Chapter 3. Creativity, innovation and opportunity finding, inclusive as differentiating entrepreneurial skills, are supported by the groundbreaking work of: Smoller & Sombart as quoted by Herbert & Link (1982), Weber (1930), Schumpeter (1939), Beaudou (1767). Bentham (1838), Von Tunen (1850), Von Magoldt (1855), Cole (1946) as quoted and described by Van Daalen (1989). A special notion is made embracing the discrepancy between the “entrepreneur” and the “small business owner” whereas the former includes a vast amount of creativity, innovation and opportunity finding as facilitating skills.

An in depth secondary analysis is conducted regarding the background and nature of creativity. The creativity model of Couger (1995) is utilised to define creativity and consists of the following concepts: person,

process, press (environment) and product. This model served as the basis of the theoretical intervention with regards to the CIO training model. Innovation is the result of creative thinking and processes. The chapter furthermore studied the nature of innovation due to the importance thereof as the key outcome of the CIO training model. This subsection describes the origin and development of innovation and the qualities of an innovative individual, directly applicable to the entrepreneur.

The third subsection examined the definition and constitution of the construct - opportunity finding. A number of techniques in assessing opportunities are investigated in order to differentiate between ideas and feasible opportunities.

A final subsection integrates the training of creativity, innovation and opportunity finding in an entrepreneurial context. This section links the theoretical review with the primary focus of the study that precedes the formulation and explanation of the CIO – training model.

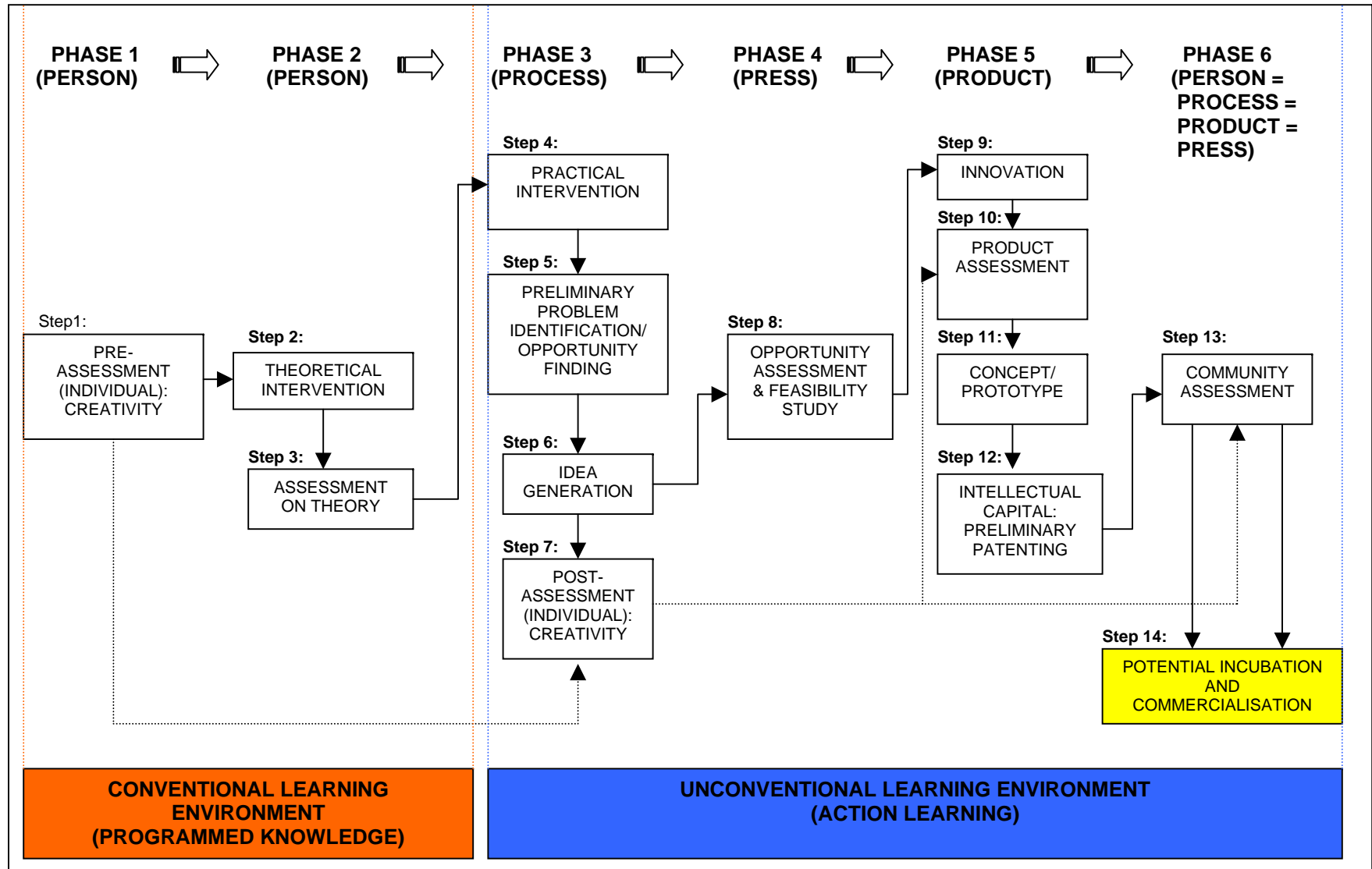
### **7.2.3 Chapter 4**

The need to develop an entrepreneurial orientated training approach opposed to the normal didactic methodology served as the basis of this chapter. It starts with the context or educational framework, which is based on a combination of the principles of action learning within an experiential learning framework. An exploration on the definition, variables, behavioural impediments, advantages and the effectiveness of action learning in an entrepreneurial context, provides subsistence as background to the development of the CIO training model. The following schematic illustration shows the make-up of the training model. A



comprehensive discussion on the different phases of the process supports the illustration in Chapter 4.

Schematic illustration X: The Creativity, Innovation and Opportunity finding training model



### **7.3 Summary and findings of empirical investigation**

#### **7.3.1 Chapter 5**

Chapter 5 provides information on the research procedures followed in conducting the empirical section of the study. The sample decision, sizes, questionnaire and method within the context of an experiential research design is described. The second section of the chapter offers a brief theoretical exploration on the methodology applied in the empirical conduct.

#### **7.3.2 Chapter 6**

The data analysis of the empirical study is described in detail in Chapter 6. The first step in the process exposed each suggested factor to an item analysis as part of establishing the internal reliability of the *Innovator*©. *Secondly* a summary of demographic significance explains the basic differences among the three groups as well as the influence of the demographics on the results of each factor of the *Innovator*©. In the *third* part the differences among the experimental and control groups are provided.

##### **i. Factor creation and reliability of the *Innovator*© questionnaire**

The following factors were analysed by means of individual items in order to establish reliability. Further analysis was conducted to exclude the possibility of one item contributing excessively to a factor. The following factors were analysed:

- Effect on society

- Business risk
- Analysis of demand
- Market acceptance
- Competitive advantage

All the factors created show high internal reliability, consistency and all items contribute fairly well to each factor.

## ii. Demographic analysis

### Gender

No significant differences exist among the groups with regards to gender (Chi-square = 2.106;  $p = 0.349$ ). The gender composition of the total sample equals to 40% female and 60% male.

### Age

Age is not considered a contributing variable in this study. The post hoc Bonferoni although showed a significantly older age distribution in the Control group compared to the Experimental group 1. Age does not correlate significantly with the scores on the factors of the *Innovator*©.

### Home language

The language groups were combined into four groups: Afrikaans, English, African and Foreign (German, Chinese and French). The latter was excluded from the analysis due to the insignificant number of respondents in these groups. The experimental groups showed matching language profiles and differs significantly from the control

group. The control group has a high number of African languages (significance: Chi square = 39.92;  $p = 0.000$ ). The factors: Effect on society, Analysis of demand and Market acceptance, showed significant differences among the three language groups in terms of their scores on the *Innovator* ©. The Afrikaans and English speakers exhibit higher scores on these factors than the African speakers. Language is considered a nuisance variable when comparing the results of the experimental groups with the control group due to the high percentage of African speaking respondents evident in the control group.

### **Race composition**

Significant differences exist in the race composition of the respondents. Experimental group 1 has an 86.4% Caucasian composition, Experiment group 2 a 76.8% Caucasian and the Control group a 54.2% Black composition. The significance is stated by a Chi-square of 28.42 and  $p = 0.000$ . When comparing the prominent race groups namely Caucasian and African and their responses to all the *Innovator* © factors, the Caucasian group consistently obtained higher scores on all factors. Race is also considered a nuisance variable.

### **Degree enrolled for**

The degrees enrolled for differ significantly from each other and support the logic of the choice of sample, as discussed in Chapter 5. Experimental group 1 consists of respondents studying Entrepreneurship as a degree of specialisation. Experiment group 2 with a sundry of commercial degrees of specialisation, and entrepreneurship as an elective module. The Control group consists

of a diverse number of degrees of specialisation, predominantly in the commercial field.

### **Year of study**

Experimental group 1 involved second year students only, due to the fact that this group was the first entrepreneurship students enrolled for the course. The size and year of study are therefore a fixed condition. 85% of Experiment group 2 and 76% of the Control group are enrolled on the third year. A fixed condition is also created due to the fact that the CIO module is only presented on the third year as an elective. It was thus impossible to establish an experiment group on the same year of study, receiving the same treatment (CIO).

### **Current entrepreneurial ventures**

The question on entrepreneurial ventures created ambiguity. Various respondents did not answer the question, only 49 responded. A differentiation between “start-up self” and “direct or indirect involvement” should have been established. This creates an opportunity for further research.

The demographic analysis did not serve as the primary objective of the study, and the significant differences among the groups with regards to demography were uncontrollable. Experiment group 1 formed part of the first entrepreneurship students taking the degree in entrepreneurship, and creativity, innovation and opportunity finding *per se*. Experiment group 2 served as the first group taking the elective. No previous documentation exists with regards to demographic comparison and interference. These variables will contribute to future research as conducted on a longitudinal basis.

### **iii. Comparison of results between Experimental and Control groups**

All factors show a significant difference between the control group and the experimental groups. The difference is most prevalent in the following factors:

- Effect on society (Eta Squared = 0,222)
- Analysis of demand (Eta Squared = 0,226)
- Competitive advantage (Eta Squared = 0,219)

Descriptive hypotheses or propositions served as the formulation of empirical testing and will form part of the summary and conclusion henceforth:

#### **Proposition 1:**

*Experimental group 1 (treated) will show significantly higher scores on the likely commercial success of innovations, than the Control group.*

This proposition is accepted based on the analysis of Table 34 (ANOVA) where the Experimental group 1 exhibit significant differences in factor results compared to the Control group.

#### **Proposition 2:**

*Experimental group 2 (treated) will show significantly higher scores on the likely commercial success of innovations, than the Control group.*

From the results obtained in Table 34 (ANOVA) it is evident that the results of Experimental group 2 compared to the Control group are statistically significant. This proposition is therefore accepted.

**Proposition 3:**

*Experimental group 1 (treated) and Experimental group 2 (treated) will show significantly higher scores on the likely commercial success of innovations, than the Control group.*

Proposition 1 & 2 could not be rejected based on the interpretation of the statistical analysis of this study. One can thus conclude that Proposition 3 is also accepted.

**Proposition 4:**

*Experimental group 1 (treated) will show significantly higher scores on the likely commercial success of innovations, than Experimental group 2 (treated).*

The proposition proposed is rejected. The results from the study shows that Experimental group 1 do not present a significantly higher score on the likely commercial success of innovations, than Experimental group 2.

**Proposition 5:**

*No significant differences exist between the Experimental groups and Control group with regards to the likely commercial success of innovations.*



This proposition is rejected based on the findings illustrated in Table 34 (ANOVA). There are significant differences among Experimental group 1 & 2 and the Control group with regards to the likely commercial success of innovations.

Conformation is furthermore provided by the Discriminant analysis, where a correct placement of 77.3% is achieved (Table 40).

#### **7.4 Recommendation**

The following recommendations are made with regards to future research of a similar or related nature:

- The sample size of experimental groups needs to be increased as the field of entrepreneurship in South Africa grows within a training context. The samples used represent a rather small portion of the potential entrepreneurship learners.
- The demographic structure of the samples has to be aligned with each other. The current study showed that significant differences exist in terms of Home language and Race composition. An opportunity is therefore created to investigate the continuous role and influence of Language and Race as detrimental or beneficial in creativity, innovation and opportunity finding training, within an entrepreneurial developmental context. These factors can furthermore enlighten researchers and educators on the existing obstacles and catalysts in the potential entrepreneur's learning and development environment, in terms of Language and Race (cultural factors).
- The CIO training model addressed the following deficiencies in entrepreneurship education directly:

- The model focused on training the entrepreneur and not the traditional manager
  - The intervention ensured the acquisition of skills with feasible opportunity finding as the primary point of convergence
  - The model addresses the entrepreneurial skills: creativity, innovation and opportunity finding directly, as part of an entrepreneurship training programme
  - Pertinent differentiation is established to understand the exact variance between an “idea” and an “opportunity”, within an entrepreneurial and market context. The training model accentuated the feasibility and realism of market related opportunities
  - The training methodology applied in this study is based on experiential and action learning and therefor overcome stifling pedagogical paradigms in teaching business and entrepreneurship
  - The model reveals more about and for the learner, due to its learner centred approach, than teaching methods that disclose more about the lecturer
  - The study offers future educators a tool and approach to cultivate creativity, innovation and opportunity finding.
- This study endeavoured to be unique (as indicated in the previous point) and the results support the statement. It can therefor be derived that the CIO training model may serve as a successful instrument in entrepreneurship training, with a specific notion to creativity, innovation and opportunity finding as differentiating entrepreneurial skills. The model may for instance be expanded and adjusted to extended timeframes and presented on higher levels of learning (e.g. post-graduate studies).

This attempt will offer entrepreneurship educators and trainers a platform for future development in the field of entrepreneurial skill facilitation. A much needed foundation for a novel science.

***“ ... no wonder that it has taken over a decade of entrepreneurial research to recognise the enormity of the problem of understanding “the elephant.” ”***

**Timmons J.A. (1994)**

## Bibliography

Ahmed P.K. 1998. Culture and climate for innovation. *European Journal of Innovation Management*, V.1 No. 1.

Alder H. 1994. The technology of creativity. *Management Decision*, V.32 No. 4.

Amabile TM. 1999. How to Kill Creativity. Breakthrough Thinking. Harvard Business Review.

Antonites AJ. & Van Vuuren JJ. 2000. “Die toepassing van ‘n inhoudsmodel rakende opleiding ter verhoging van entrepreneuriese prestasie”. Dissertation, University of Pretoria, South Africa.

Antonites AJ & Van Vuuren JJ. 2002. *Recent developments regarding content of entrepreneurship training programs*. Proceedings of the IntEnt 2001 Conference, South Africa, June, 2001.

Ardichvili A, Cardozo R & Sourav R. 2003. A theory of entrepreneurial opportunity identification and development. *Journal of Business Venturing*, V 18.

Badie K. 2002. *Creative idea generation via interpretative approach to analogical reasoning*, V.31. No. 9/10.

Bagshaw P. 1996. *Viva South African Entrepreneurs*. Lifespan Publications: Durban: 1-150

- Begley TM & Boyd DP. 1987a. A Comparison of Entrepreneurs and Managers of Small Business Firms. *Journal of Management*, V.13, 1: 99-108.
- Begley TM & Boyd DP. 1987b. Psychological Characteristics associated with Performance in Entrepreneurial Firms and Smaller Businesses. *Journal of Business Venturing*, V.2, Winter: 79-93
- Binks M & Vale P. 1990. *Entrepreneurship and economic change*. McGraw-Hill Book Company: London.
- Blanche MT & Durrheim K. 1999. *Research in practice: applied methods for the social sciences*. University of Cape Town Press: Cape Town
- Boden MA. 1994. *Dimensions of creativity*. MIT Press: London, England
- Boden MA. 1990. *The creative mind: Myths and mechanisms*. Basic Books: United States of America.
- Boshoff AB. & Van Vuuren JJ. 1992. *Towards understanding the entrepreneurial personality - A South African study*. Proceedings of the IntEnt 92 Conference, Dortmund, June 23-26, 1992.
- Botha V.A. 1999. *The Assessment of Creativity*. MA Dissertation, University of South Africa.
- Bourner T & Frost P 1996a. Experiencing action learning. *Employee Counselling Today: The Journal of Workplace Learning*, Vol. 8 No. 6.
- Bourner T. & Frost P. 1996b. In their own words: the experience of action learning in higher education. *Education & Training*, Vol. 38. No. 8.

Bourner T. & Weinstein K. 1996c. Just another talking shop? Some of the pitfalls in action learning. *Employee Counselling Today, The Journal of Workplace Learning*, Vol. 8 No. 6.

Brink A. 2000. *The creative matrix: Anxiety and the origin of creativity*. Peter Lang Publishers: Boston

Buckley R & Caple T. 1991. *The theory and practise of training*. (Second edition), Kogan Press: London.

Burch JG. 1986a. *Entrepreneurship*. John Wiley & Sons: New York.

Burch JG. 1986b. Profiling the Entrepreneur. *Business Horizons*, Sept. – Oct.

Carrier C. 1999. *Teaching creativity, innovation and entrepreneurship: On the necessity for new pedagogical paradigms*. 44<sup>th</sup> ICSB World Conference Proceedings.

Casson M. 1990. *Entrepreneurship*. Edward Elgar Publishing: England.

Chaharbaghi K & Newman V. 1996. Innovating: towards an integrated learning model. *Management Decision*, V. 34. No. 4

Churchill, N.1989. The Entrepreneur Paradigm: Chaos and Catastrophes among Quantum Jumps? *Entrepreneurship Theory and Practice*, Fall, (14)

Coetzee GM.1979. *Die ontwikkeling van die prestasiemotief en die verwantskap tussen prestasiemotivering en entrepreneurskap*. Thesis MBA – University of Pretoria

Cooper AC, Hornaday JA. & Vesper KH. 1997. Entrepreneurship over time. *Frontiers of Entrepreneurship Research*, Babson College

Cooper DR. & Emory CW. 1995. *Business research methods*. Irwin: USA.

Cornwall JR. & Perlman B. 1990. *Organizational Entrepreneurship*. Irwin: Boston.

Couger J.D. 1995. *Creative problem solving and opportunity finding*. International Thomson Publishing Company

Cozby PC.1985. *Methods in Behavioral Research*. (Third Edition). Mayfield Publishing Company: California.

Cozijnsen A. & Vrakking W.1993. *Handbook of Innovation Management*. Blackwell Publishers: UK.

Csikszentmihalyi M. 1996. *Creativity: Flow and the psychology of discovery and invention*. Harper Collins Publishers: United States of America.

Cumming BS. 1998. Innovation overview and future challenges. *European Journal of Innovation Management*, V.1. No. 1.

Cunningham JB, Gerrard P, Schoch H. & Lai Hong C. 2002. An entrepreneurial logic for the new economy. *Management Decision*, V. 40. No. 8.

Cusins P. 1996. Action learning revisited. *The Journal of workplace Learning*, Vol. 8. No. 6.

Dahlqvist J, Davidsson P & Wiklund J. 1999. *Initial conditions as predictors of new venture performance: A replication and extension of the Cooper et al. study*. 44<sup>th</sup> ICSB World Conference Proceedings

Davis GA. 1986. *Creativity is forever*. Kendall/Hunt Publishing Company: United States of America.

Deakins D & Freel M. 1998. Entrepreneurial learning and growth process in SME's. *The Learning Organisation*, V.5, 3.

De Bono E. 1996. *Serious Creativity*. HarperCollins Business: London.

DeFusco RA, McLeavey DW, Punto JE & Runkle DE. 2001. *Quantitative methods for investment analysis*. AIMR Publications: Virginia.

Diamantopoulos A & Schlegelmilch BB. 2002. *Taking the fear out of data analysis*. Thomson Learning: London.

Ducheneaut B. 1997. *Entrepreneurship and higher education, from real-life context to pedagogical challenge*. Paper presented at the Conference Internationalizing Entrepreneurship Education and Training, IntEnt97, Monterey Bay (California/USA), June.



Drucker PF. 1994. *Innovation and Entrepreneurship*. Butterworth & Heinemann, Great Britain.

Dyer T. 1997. *Become a Professional Entrepreneur*. Entrepreneur, July.

Feist GJ & Runco MA. 1993. Trends in the creativity literature: An analysis of research in the *Journal of Creative behaviour* (1967 – 1989). *Creativity Research Journal*, V.6, 3.

Findlay CS. & Lumsden CJ. 1988. *The creative mind*. Academic Press: London

Ford F. 1999. Information retrieval and creativity: Towards support for the original thinker. *Journal of Documentation*, V. 55. No. 5.

Garavan TN. & Deegan L. 1995. Discontinuous change in organisations. Using training and development interventions to develop creativity. *Industrial and Commercial Training*. V. 27 No. 11.

Garavan TN & O' Cinneide B. 1994. Entrepreneurship education and training programmes: a review and evaluation – Part 1. *European Journal of Industrial Training*, V. 18, 8: 3 - 12

Gartner WB. 1985. A Conceptual Framework for Describing the Phenomenon of New Venture Creation. *Academy of Management Review*, V. 13. No. 4 .

Gartner WB. 1989. Some suggestions for research on Entrepreneurial Traits and Characteristics. *Entrepreneurship Theory and Practice*, Summer 1989.

Gibb AA. 1985. Has entrepreneurship a place in the University? An inaugural lecture, Durham University Business School, November 1985.

Gibb AA. 1993. The enterprise culture and education: understanding enterprise education and its links with small business, entrepreneurship and wider educational goals. *International Small Business Journal*, V. 11,3: 11-34

Gilmartin MJ. 1999. Creativity: The fuel of Innovation. *Nurs Admin Quarterly*. V. 23, 2

Global Entrepreneurship Monitor. 2002. *Executive Report*. Graduate School of Management, University of Cape Town: 1- 64.

Gruber HE, Terrell A & Wertheimer M. 1962. *Contemporary approaches to creative thinking: A symposium held at the University of Colorado*. Atherton Press, New York.

Guedalla M et al. 1997. *The KUBUS System – An Holistic Approach to Enterprise an Entrepreneurship*. Proceedings of the Conference Internationalizing Entrepreneurship Education and Training, IntEnt97, Monterey Bay (California/USA), June 25 – 27, 1997

Harris S, Forbes T & Fletcher M. 2000. Taught and enacted strategic approaches in young enterprises. *International Journal of Entrepreneurial Behaviour and Research*. V. 6, 3.

Herbig P. & Jacobs L. 1996. *Creative problem solving styles in the USA and Japan*. *International Marketing Review*. V. 13, 2.

Hisrich RD. & Peters MP. 2002. *Entrepreneurship*. (Fifth edition) Irwin/McGraw-Hill: USA.

Hisrich RD. & Peters MP. 1998. *Entrepreneurship*. (Fourth edition) Irwin/McGraw-Hill: USA.

Hirschowitz R. 1992. Myths and facts: types of assistance needed for informal sector business to flourish. *Finance Week*, V. 53, Issue 5, April 30.

Howell F. 1994. Action learning and action research management education and development. *The Learning Organisation*, V. 1, 2: 15-22

Hyvärinen L. 1993. *Innovativeness and its indicators in small and medium-sized industrial enterprises*. Proceedings of the IntEnt93 Conference Vienna, July.

Isaksen SG. 1987. *Frontiers of creativity research: Beyond the basics*. Bearly Limited: United States of America.

Isaksen SG, Murdock MC, Firestien RL. & Treffinger DJ. 1993. *Understanding and recognizing creativity: The emergence of a discipline*. Ablex Publishing: Norwood New Jersey.

Jalan A & Kleiner BH. New developments in developing creativity. *Journal of Managerial Psychology*, V.10, 8.

James C & Roffe I. 2000. The evaluation of goal and goal free training innovation. *Journal of European Industrial Training*. V. 24, 1.

Kajanus M. 2000. A model for creating innovative strategies for an enterprise and its application to a rural enterprise. *Management Decision*. V. 38, 10.

Klandt H. 1993. *Methods of teaching: What is useful for entrepreneurship education?*. Proceedings of the Conference Internationalizing Entrepreneurship Education and Training, IntEnt93. Vienna (Austria), July 5-7, 1993

Klandt H. 1998. *Entrepreneurship education at the European Business School*. Proceedings of the Conference Internationalizing Entrepreneurship Education and Training, IntEnt98. Oestrich-Winkel, Germany, July 26-28

Kleysen RF. & Street CT. 2001. Toward a multi-dimensional measure of individual innovative behaviour. *Journal of Intellectual Capital*. V. 2, 3.

Koo LC. 1999. Learning action learning. *Journal of Workplace Learning*. V. 11, 3.

Kuratko DF. & Hodgets C.1998. *Entrepreneurship - A contemporary approach*. The Dryden Press, USA.

Lane DM. 2003. *Hyperstats Online: An introductory statistics textbook and online tutorial*. Retrieved November 13, 2003 from the World Wide Web: [http://davidmlane.com/hyperstat/intro\\_ANOVA.html](http://davidmlane.com/hyperstat/intro_ANOVA.html).

Leitch CM. & Harrison RT. 1999. A process model for entrepreneurship education and development. *International Journal of Entrepreneurial Behaviour & Research*. V. 5, 3.

Lemke E & Wiersma W. 1976. *Principles of psychological measurement*. Rand McNally College Publishing Company: Chicago

Loucks K. 1990. *Training Entrepreneurs for small business creation*. Lessons from experience. International Labour Office, Geneva.

Lowe A. 1995. The basic social processes of entrepreneurial innovation. *International Journal of Entrepreneurial Behaviour & Research*. V.1, 2.

Livesay H.C. 1995. *Entrepreneurship and the Growth of Firms*. Edward Elgar Publishing Limited: Great Britain.

Mahlberg T. 1995. *Team venture as a new teaching and learning method in entrepreneurial education*. Proceedings of the Conference Internationalizing Entrepreneurship Education and Training, IntEnt95. Bunbury, WA, June.

Majaro S. 1988. *The Creative Gap - Managing Ideas for Profit*. Longman, Great Britain.

Man J. 2001. Creating innovation. *Work Study*, V. 50, 6.

Mare CF. 1996. *Education directed to Entrepreneurship*. Kagiso Publishers: Pretoria

Martin M.J.C. 1994. *Managing Innovation and Entrepreneurship in Technology-based Firms*. John Wiley & Sons, Inc: New York.

McAdam R & McClelland J. 2002. Individual and team based idea generation within innovation management: organisational and research agendas. *European Journal of Innovation Management*, V.5, 2.

McClelland, DC. 1961. *The Achieving Society*. Princeton: Von Nostrand.

McFadzen E. 2000a. What we can learn from creative people: The story of Brian Eno. *Management Decision*, V.38, 1.

McFadzen E. 2000b. Techniques to enhance creative thinking. *Team Performance Management: An International Journal*, V. 6, ¾.

McFadzen E. 2002c. Developing and supporting creative problem solving teams: part 1 – a conceptual model. *Management decision*, V. 40, 5.

McFadzen E. 2002d. Developing and supporting creative problem solving teams: part 2 – facilitator competencies. *Management decision*, V. 40, 6.

McGill I & Beaty L.1992. *Action learning. A practitioner's guide*. Kogan Page: London.

McGill I & Beaty L.1995. *Action learning. A guide for professional, management and educational development*. Kogan page: London.

McManus KL. *On becoming creative*. USASBE Conference Proceedings, San Diego, June 1999.

Miller D & Friesen PH. 1982. Innovation in Conservative and Entrepreneurial Firms: Two models of Strategic Momentum. *Strategic Management Journal*, V.3.

Morris R. & Morris S. 1997. *Enterprise education: An important lesson to learn*. Proceedings of the Conference Internationalizing Entrepreneurship Education and Training, IntEnt97, Monterey Bay (California/USA), June 25 – 27, 1997.

Morris M.H. & Hooper V.A. 1996. Contemporary issues in entrepreneurship: research perspectives from within South Africa. *S.A. Journal: Entrepreneurship & Small Business*, November 1996.

Morris R. & Wingham D. 1997. *Developing a clever workforce: meeting small business training needs for improved regional outcomes*. Proceedings of the Conference Internationalizing Entrepreneurship Education and Training, IntEnt97, Monterey Bay (California/USA), June 25 – 27, 1997.

Naffziger DW, Hornsby JS & Kuratko DF. 1994. A proposed research model of entrepreneurial motivation. *Entrepreneurship Theory and Practice*, Spring.

Nieman G & Bennet A. 2002. *Business Management: A value chain approach*. Van Schaik Publishers: Pretoria.

Nunnally, JC.1978. *Psychometric theory*. (2nd edition). McGraw-Hill: New York.

Nystrom H. 1979. *Creativity & Innovation*. John Wiley & Sons: New York.

O' Hara S, Webber T & Reeve S.1996. Action learning in management education. *Education & Training*. V. 38, 8.

Parkes D. 1998. Action learning: business applications in North America. *Journal of Workplace Learning*. V. 10, 3.

Pedler M. 1991. *Action learning in practice*. Gower Limited: England.

Pearson A.W. 1993. *Innovation, uncertainty and the Entrepreneur*. Proceedings of the IntEnt93 Conference Vienna, July.

Piatier A. 1984. *Barriers to Innovation*. Francis Pinter Publishers: London.

Pinchot G. & Pinchot E. 1996. *Five Drivers of Innovation*. Executive Excellence, January.

Plaschka GR. & Welsch HP. 1990. Emerging structures in Entrepreneurship education: Curricular designs and strategies. *Entrepreneurship: Theory and Practise*, Spring 1990.

Quinn JB. 1985. Managing Innovation: controlled chaos. *Harvard Business Review*, V.85, 3:73-84:

Revans RW. 1980. *Action learning: new techniques for management*. Blond & Briggs: London.

Revans RW. 1987. *International perspectives on action learning*. Manchester Training Handbooks. V. 9. IDM Publications: Manchester.

Rickards T. 1999. *Creativity and the management of change*. Blackwell Business: United Kingdom.



Robinson M. 2001. It works, but is it action learning? *Education & Training*, V. 43, 2.

Roffe I. 1999. Innovation and creativity in organisations: a review of the implications for training and development. *Journal of European Industrial Training*. V. 23, 3.

Rosa P & McAlpine A. *A career orientation towards enterprise*. Proceedings of the IntEnt92 Conference, London March 9-11.

Rothenberg A & Hausman CR. 1976. *The creativity question*. Duke University Press: Durham, N.C.

Salkind NJ. 2000. *Exploring Research*. (4<sup>th</sup> edition). Prentice Hall, Upper Saddle River: New Jersey.

Sahlman WA & Stevenson HH. 1991. *The Entrepreneurial Venture*. Harvard Business School Publications: Boston, Massachusetts.

Sanzota D. 1977. *Motivational Theories and Applications for Managers*. Amacom: New York.

Sexton DL & Bowman NB. 1984. Entrepreneurship education: Suggestions for increasing effectiveness. *Journal of Small Business Management*, April 1987.

Sexton DL. & Bowman NB. 1987. Evaluation of an innovative approach to teaching entrepreneurship. *Journal of Small Business Management*, January 1987.

Sexton DL. & Kasarda JD. 1996. *The state of the art of Entrepreneurship*. PWS-Kent Publishing Company: Boston.

Shaw MP. & Runco MA. 1994. *Creativity and Affect*. Ablex Publishing Corporation: Norwood New Jersey.

Smith N.R. & Miner J.B. 1984. Motivational Considerations in the Success of Technologically Innovative Entrepreneurs. *Frontiers of Entrepreneurial Research*, 488 - 495.

Smith SM, Ward TB & Finke RA. 1995. *The creative cognition approach*. The MIT Press: Massachusetts USA.

Smith PAC. 1997. Q'ing action learning: more on minding our P's and Q's. *Management decision*, V. 35, 5.

Smith PAC. 1998. Action learning: praxiology of variants. *Industrial and Commercial Training*, V. 30, 7.

Smolensky ED. & Kleiner BH. 1995. How to train people to think more creatively. *Management Development Review*. V. 8, 6.

Solomon G & Fernald L. 1991. Trends in small business management and Entrepreneurship education in the United States. *Entrepreneurship: Theory and Practise*, Spring 1991.

Sternberg R.J. 1999. *Handbook of creativity*. Cambridge University Press: United Kingdom

Taylor CW. 1972. *Climate for creativity*. Pergamon Press: New York.

Thompson JL. 1999. The world of the entrepreneur – a new perspective. *Journal of Workplace Learning: Employee Counselling Today*, V.11, 6.

Timmons, JA. 1994. *New venture creation: entrepreneurship for the 21st century*. Irwin.

Timmons, J.A. 1999. *New venture creation: entrepreneurship for the 21st century*. Irwin.

Torrance EP. 1995. *Why Fly: A philosophy of creativity*. Ablex Publishing Corporation: Norwood, New Jersey.

UCLA Academic Technology Services. 2003. SPSS FAQ: What does Cronbach's Alpha mean? Retrieved November 13, 2003 from the World Wide Web: <http://www.ats.ucla.edu/stat/spss/faq/alpha.html>

Van Daalen HJ. 1989. *Individual Characteristics and Third World Entrepreneurial Success*. Doctor Commercii. University of Pretoria.

Van Praag M. 1996. *Determinants of Successful Entrepreneurship*. Thesis Publishers, Amsterdam.

Van Tonder. 2003. "*Beleid moet verander om werkloosheid op te los*". Rapport 18<sup>th</sup> of May. Naspers.

Van Vuuren JJ. 1992. *Die onderskeid van suksesvolle en minder suksesvolle entrepreneurs, bankamptenare en staatsamptenare deur middel van persoonlikheidstrekke, belangstellings en biografiese veranderlikes*. Dissertation, DBA, Universiteit van Pretoria.

Van Vuuren JJ.1997 *Entrepreneurship education and training: A prospective content model*. Unpublished, UP: 1-15

Van Vuuren J.J & Nieman G. 1999. *Entrepreneurship education and training: A model for syllabi/curriculum development*. 44<sup>th</sup> ICSB World Conference Proceedings.

Vesper KH.1980. *New Venture Strategies*. Prentice-Hall: UK.

Vesper KH & McMullan WE. 1988. Entrepreneurship: Today courses, tomorrow degrees? *Entrepreneurship Theory and Practice*, Fall 1988.

Vroom V.H.1964. *Work and motivation*. New York: John Wiley and Sons.

Watson CH. 1994. *Direction for entrepreneurship research: viewpoint of academics*. DBA, University of Pretoria.

Welsch, PH. 1993. *Entrepreneurship education and training infrastructure: External interventions in the classroom*. Proceedings of the IntEnt93 Conference Vienna, July 5-11.

Williams A. 1999. *Creativity, Invention & Innovation: A guide to building your business future*. Allen & Unwin: Australia.

Williams S. 2001. Increasing employees' creativity by training their managers. *Industrial and Commercial Training Volume*. V. 33, 2.

Wilmer H.A. & Pauling L. 1991. *Creativity: Paradoxes & reflections*. Chiron Publications: Wilmette Illinois.

Whiting B.G. & Solomon G.T. 1989. *Key issues in Creativity Innovation & Entrepreneurship*. Bearly Limited: New York.

*World Competitiveness Yearbook*. Lausanne: IMD International, 2003

Zikmund WG. 1997. *Business Research Methods*. The Dryden Press: USA.

Zimmerer TW & Scarborough NM. 1996. *Entrepreneurship and New Venture Formation*. Prentice Hall: New Jersey.

Zimmerer TW & Scarborough NM. 1998. *Essentials of Entrepreneurship and Small Business Management*. Prentice Hall: USA.

**ADDENDUM:**

QUESTIONNAIRE: INNOVATOR ©

ASSESSING THE LIKELY COMMERCIAL SUCCESS  
OF IDEAS AND INVENTIONS. (PROBABILITY)

Answer each question by drawing a neat circle (O) around a number in a shaded block or write your answer in the shaded space provided.

Respondent  
Group

V1	<input type="text"/>	<input type="text"/>	<input type="text"/>	1-3
V2	<input type="text"/>	4		

**Demographic information**

a. What is your gender?

Male	<b>1</b>
Female	<b>2</b>

V3  5

b. What is your age in completed years?

V4   6-7

c. What is your home language?

V5   8-9

d. What is your race?

V6   10-11

e. What is your Academic year of study?

V7   12-13

**f.** What is Degree/Diploma do you possess?

V8 

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 14-15

**g.** Shortly describe any current/previous entrepreneurial ventures established.

V9 

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 16-17  
V10 

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 18-19  
V11 

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 20-21

**Group A: Effects on Society**

**1. Legality**

In terms of relevant laws regulations and industry standards (particularly relating to product safety and risk), this invention will:

Adequately meet all legal requirements	<b>5</b>
meet most legal requirements	<b>4</b>
Need further legality and/or safety checks	<b>3</b>
Need some major modifications	<b>2</b>
Fail to meet the legal requirements	<b>1</b>

V12  22

**2. Safety**

This invention, process or product will probably be:

Quite safe if used under normal operating conditions	<b>5</b>
Safe if used properly and according to instructions	<b>4</b>
Safe if the user is properly trained/qualified	<b>3</b>
Unsafe unless modifications are made	<b>2</b>
quite dangerous in its present form	<b>1</b>

V13  23

**3. Environmental impact**

In terms of its effects on the environment (e.g. through excessive energy usage, pollution, misuse and/or waste of vital resources, etc.) this invention:

Should contribute to an improved quality of life	<b>5</b>
may result in some environmental improvements	<b>4</b>
should have little or no adverse effect	<b>3</b>
could create some minor environmental "damage"	<b>2</b>
may seriously damage the environment	<b>1</b>

V14  24



**4. Societal impact**

In terms of its impact on the welfare of society at large (or on some identifiable part of it), this invention:

will have considerable benefits for society generally	<b>5</b>
should benefit some sections of the community	<b>4</b>
may be of some benefit to society	<b>3</b>
should have little or no effect on society	<b>2</b>
may have some detrimental effects	<b>1</b>

V15  25

**Group B: Business risk**

**5. Technical/functional feasibility**

Thorough testing, to assess whether or not the invention will work as it is intended to do, shows that it:

works reliably under all normal operating conditions	<b>5</b>
works satisfactorily if used according to instructions	<b>4</b>
will work if used with care by an expert	<b>3</b>
has some technical problems which need to be solved	<b>2</b>
does not work properly yet	<b>1</b>

V16  26

**6. Production feasibility**

In terms of availability of materials, equipment and other resources, and know-how of the technical processes needed, production of this invention has:

no problems and can start immediately	<b>5</b>
minor problems which may lead to brief delays	<b>4</b>
minor problems, and delays of several months are likely	<b>3</b>
serious problem leading to delays of at least six months	<b>2</b>
many serious problems and cannot start for at least a year	<b>1</b>

V17  27

**7. Stage of development**

This invention, at least in the form of a fully working prototype, has:

no technical problems, and is complete or almost complete	<b>5</b>
some problems but should be completed within three months	<b>4</b>
some problems but should be completed within six months	<b>3</b>
some major problems and may be completed in nine months	<b>2</b>
an uncertain amount completion date, but is at least a year away	<b>1</b>

V18  28

**8. Development cost**

Total funding needed to cover all likely development costs, and to bring the invention to the point of being ready to market or use, is estimated to be:

minimal, available, and not cause any cash flow problems	<b>5</b>
light, probably available, with minor cash flow problems	<b>4</b>
moderate, probably available, but with debt servicing problems	<b>3</b>
fairly heavy, not easy to get and hard to service	<b>2</b>
substantial, and fairly difficult to get and to service	<b>1</b>

V19  29

**9. Payback period**

The period needed to recover the overall investment in developing the invention is likely to be:

under one year	<b>5</b>
one to three years	<b>4</b>
four to six years	<b>3</b>
seven to nine years	<b>2</b>
ten years or more	<b>1</b>

V20  30

**10. Profitability**

Expected revenue from selling this invention should cover all relevant direct and indirect costs, and earn average annual pre-tax profits:

in excess of 30%	<b>5</b>
of between 25 and 30%	<b>4</b>
of between 20 and 25%	<b>3</b>
of between average bank interest and 20%	<b>2</b>
below the current bank interest rate	<b>1</b>

V21  31

**11. Marketing research**

The research needed to make the invention "market-ready", and to properly and accurately assess its likely success in the market, will probably be:

no problem and therefor inexpensive	<b>5</b>
fairly straightforward and at reasonable cost	<b>4</b>
moderately difficult and expensive	<b>3</b>
rather difficult and expensive	<b>2</b>
very difficult and therefor very costly	<b>1</b>

V22  32

**12. Research and development**

The technical research and development needed to bring the invention to the stage of being ready to produce is expected to:

be quite easy	<b>5</b>
be reasonably straight forward	<b>4</b>
show up some problems	<b>3</b>
prove rather complicated	<b>2</b>
be very difficult	<b>1</b>

V23  33

**Group C: Analysis of demand**

**13. Potential market**

The total market for this type of invention or product would appear to be:

very large	<b>5</b>
quite large enough to ensure success	<b>4</b>

V24  34

adequate to give a viable market share	3
just adequate (and will need some aggressive marketing)	2
very limited (very much specialised and/or local)	1

**14. Product life cycle**

The life cycle of this invention or product is expected to be:

at least ten years	5
between six and ten years	4
three to six years	3
one to three years	2
under one year	1

V25  35

**15. Potential sales**

Expected total sales revenue from this product or invention during its expected life cycle is likely to be:

very large (over R15 million)	5
quite substantial (between R5 and R10million)	4
most satisfactory (between R1 and R5 million)	3
adequate (between R250 000 and R1 million)	2
small (probably under R250 000)	1

V26  36

**16. Likely trend in market**

The market demand for this type of invention or product seems to be:

growing rapidly	5
growing at moderate speed	4
growing, but slowly	3
fairly stable	2
falling	1

V27  37

**17. Stability of demand**

Fluctuations in market demand for this invention or product are expected to be:

minor and easily predicted	5
minor to moderate, and fairly easy to predict	4

V28  38

moderate and usually predictable	<b>3</b>
moderate to large, and difficult to predict	<b>2</b>
fairly large and quite unpredictable	<b>1</b>

**18. Potential product-line expansion**

The potential for additional products, models, lines, styles, qualities, price ranges and other variations is:

excellent	<b>5</b>
quite good	<b>4</b>
uncertain	<b>3</b>
limited to minor modifications only	<b>2</b>
virtually nil	<b>1</b>

V29  39

**Group D: Market Acceptance**

**19. Learning**

The amount of learning and practice needed for correct and safe use of the invention or product is:

very little - minimal instructions needed	<b>5</b>
quite manageable	<b>4</b>
moderate	<b>3</b>
quite considerable	<b>2</b>
extensive and quite demanding - instructions are detailed	<b>1</b>

V30  40

**20. Need**

The "level of need" filled by this invention or product (i.e. its "level of usefulness") is:

very high	<b>5</b>
high	<b>4</b>
moderate	<b>3</b>
low	<b>2</b>
very low	<b>1</b>

V31  41

**21. Dependence**

The extent to which the sale or use of this product or invention depends on its linkage(s) with other products or processes is expected to be:

very low - it is quite independent	<b>5</b>
low - it is fairly independent	<b>4</b>
moderate - depends somewhat on other products or processes	<b>3</b>
high - depends heavily on other products or processes	<b>2</b>
very high - can only work with other products or processes	<b>1</b>

V32  42

**22. Visibility**

The advantages or benefits of this invention or product to likely users are:

highly visible	<b>5</b>
fairly obvious to most	<b>4</b>
moderately obvious - some users may need help	<b>3</b>
barely visible - most users will need help	<b>2</b>
not obvious - all users will need detailed demonstration	<b>1</b>

V33  43

**23. Promotion**

The costs and effort needed to promote the major features, advantages and benefits of this invention or product are likely to be... compared with expected sales:

very low	<b>5</b>
fairly low	<b>4</b>
Moderate	<b>3</b>
somewhat high	<b>2</b>
very high	<b>1</b>

V34  44

**24. Distribution**

The costs and difficulty of setting up effective distribution channels for this product or invention will probably be... compared expected sales:

very low	<b>5</b>
fairly low	<b>4</b>
moderate	<b>3</b>
somewhat high	<b>2</b>
very high	<b>1</b>

V35  45

**25. After-sale service**

The cost and difficulty associated with providing good after-sales service for this product is likely to be... compared with expected sales:

very low	<b>5</b>
fairly low	<b>4</b>
Moderate	<b>3</b>
somewhat high	<b>2</b>
very high	<b>1</b>

V36  46

**Group E: Competitive Advantage**

**26. Appearance**

In comparison with its competition and/or substitutes, this product's appearance will be:

highly attractive	<b>5</b>
reasonably attractive	<b>4</b>
of average appearance	<b>3</b>
rather lacking in visual appeal	<b>2</b>
inferior, with little customer appeal	<b>1</b>

V37  47

**27. Function**

Compared with competitors and/or substitutes, the performance of this product, invention or process will be:

much superior	<b>5</b>
somewhat superior	<b>4</b>
similar	<b>3</b>
somewhat inferior	<b>2</b>
much inferior	<b>1</b>

V38  48

**28. Durability**

Compared to its competitors and/or substitutes, the durability and reliability of this invention or product is likely to be:

much superior	<b>5</b>
somewhat superior	<b>4</b>
similar	<b>3</b>
somewhat inferior	<b>2</b>
much inferior	<b>1</b>

V39  49

**29. Price**

Compared with its competition and/or substitute products, the selling price of this product or invention will probably be:

considerably low	<b>5</b>
somewhat lower	<b>4</b>
about the same	<b>3</b>
somewhat higher	<b>2</b>
considerably higher	<b>1</b>

V40  50

**30. Existing competition**

Competition from existing firms, products, processes or inventions is expected to be:

virtually non-existent	<b>5</b>
weak at present, but needs careful monitoring	<b>4</b>
moderately strong - need to be alert to potential threat	<b>3</b>
strong enough to be a potentially serious threat	<b>2</b>
very severe, making a viable market share hard to achieve	<b>1</b>

V41  51



**31. New competition**

Competitive reaction form new entrants to the industry (i.e. new firms, products, etc.) is likely to be:

slow and weak - no threat to competitive position	<b>5</b>
slow but fairly strong - strategic action needed in future	<b>4</b>
moderately quick and moderately strong - must be watched closely	<b>3</b>
fast and fairly threatening	<b>2</b>
fast and posing a serious threat to competitive position	<b>1</b>

V42  52

**32. Protection**

An appropriate form of protection (through patent, design registration, trademark, copyright, license, etc.)

has already been successfully taken out	<b>5</b>
is presently being investigated or applied for	<b>4</b>
may be (or will be) investigated in the future	<b>3</b>
has not yet been considered	<b>2</b>
was applied for, but unsuccessfully	<b>1</b>

V43  53