

INDUCING ENTREPRENEURIAL CREATIVITY, INNOVATION AND OPPORTUNITY- FINDING SKILLS

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Summary

A generally accepted definition of an entrepreneur is 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 creativity and innovation. The fundamental skill to "create", therefore generating an idea and transforming it into a viable growth-oriented business, forms an unconditional and integrated necessity in entrepreneurship training programmes. Many researchers in this field emphasise 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 exists 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 behaviour and actions of the entrepreneurship learner. Three purposive samples were used, on the basis of an experimental design. Ratio data were obtained by means of a reliable measuring instrument (Chronbach's alpha on an acceptable level). ANOVA as well as a discriminant analysis indicated statistically significant differences between the various groups.

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

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1 Introduction

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 fully addressed. The World Competitiveness Report (2003) placed South Africa in the 18th 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 among the 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 per cent until the year 2014 in order to lower the extreme current unemployment rate of 29 per cent to an acceptable level of 11 per cent. The current unemployment rate implies that approximately 13.5 million individuals are part of the economically 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. Businesses with human resource relations of 1 to 19 (the so-called small business ventures) are already contributing about 47 per cent to job creation in comparison to the 34 per cent of the formal sector. It is also pointed out that about 10 per cent 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. Kuratko and Hodgetts (1998: 10) conclude by pointing out that both the economic and social influence of entrepreneurs have by far the largest impact on job creation, innovation and economic renewal compared to the formal sectors world-wide. This study differentiates between "entrepreneurship" and "small business management". The field of entrepreneurship in South Africa has certain unique but limiting characteristics. These traits contribute directly to the symptoms currently 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. One of the main problem areas in this field is the role of education and training in the generation of entrepreneurial activity. The

GEM (*Global Entrepreneurship Monitor*) report of 2003 provides unquestionable evidence regarding the importance of entrepreneurship education and training.

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'Conneide (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). The primary focus of the research falls on the areas of the entrepreneurial skills creativity, innovation and opportunity finding within a training context. A training model was developed for this purpose and tested according to the outcomes of entrepreneurial innovation.

2

Terminology

The following core constructs, as presented in the study, are defined:

Entrepreneurship:

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 Hodgetts (1998: 31) are used. According to these definitions the entrepreneur is regarded as an individual with the potential of creating a vision from virtually nothing. This is fundamentally a

human creative action. Energy is invested in the initiation process by initiating the startup of a company rather than to merely analyse and be an onlooker in the process of forming a new business. This vision and action include the willingness to take a calculated risk. This risk envelops personal, social, 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 is able 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.

Entrepreneurship education and training:

Entrepreneurial training and education act as a facilitator for entrepreneurial activities, with the main focus on stimulating entrepreneurial activity and performance. 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).

Creativity:

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 merely 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.*

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 of changing “raw ideas” into tangible, value-driven innovations.

Opportunity identification:

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 consistent with knowledge and information gaps. This is the result of certain vacuums/openings present in the market or business branch.

3**Entrepreneurship education**

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). 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 regards 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 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.

4**Creativity, innovation and opportunity finding – differentiating entrepreneurial skills**

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 1930s Schumpeter (1939) supported facts with the statement that the entrepreneur is an individual who 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 said phenomena are formulated with the “new” in mind, which simply implies “innovation” and is fuelled by creativity.

Carland *et al.* (1984), as quoted by Watson (1994: 44), stress the eventual difference between the entrepreneur and the average small businessperson/manager as the critical application or omission of innovation. 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 are 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.

5

The CIO – Training model (Creativity, Innovation and Opportunity Finding)

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, as indicated below.

Figure 1
Differentiation between “didactic” and “entrepreneurial” training methods

Didactic method	Enterprising method
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))

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 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. 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 & 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).

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. 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 to 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. 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 form an integral part of action learning. The following illustration offers a graphic lay-out of the CIO training model. A detailed explanation will follow the latter.

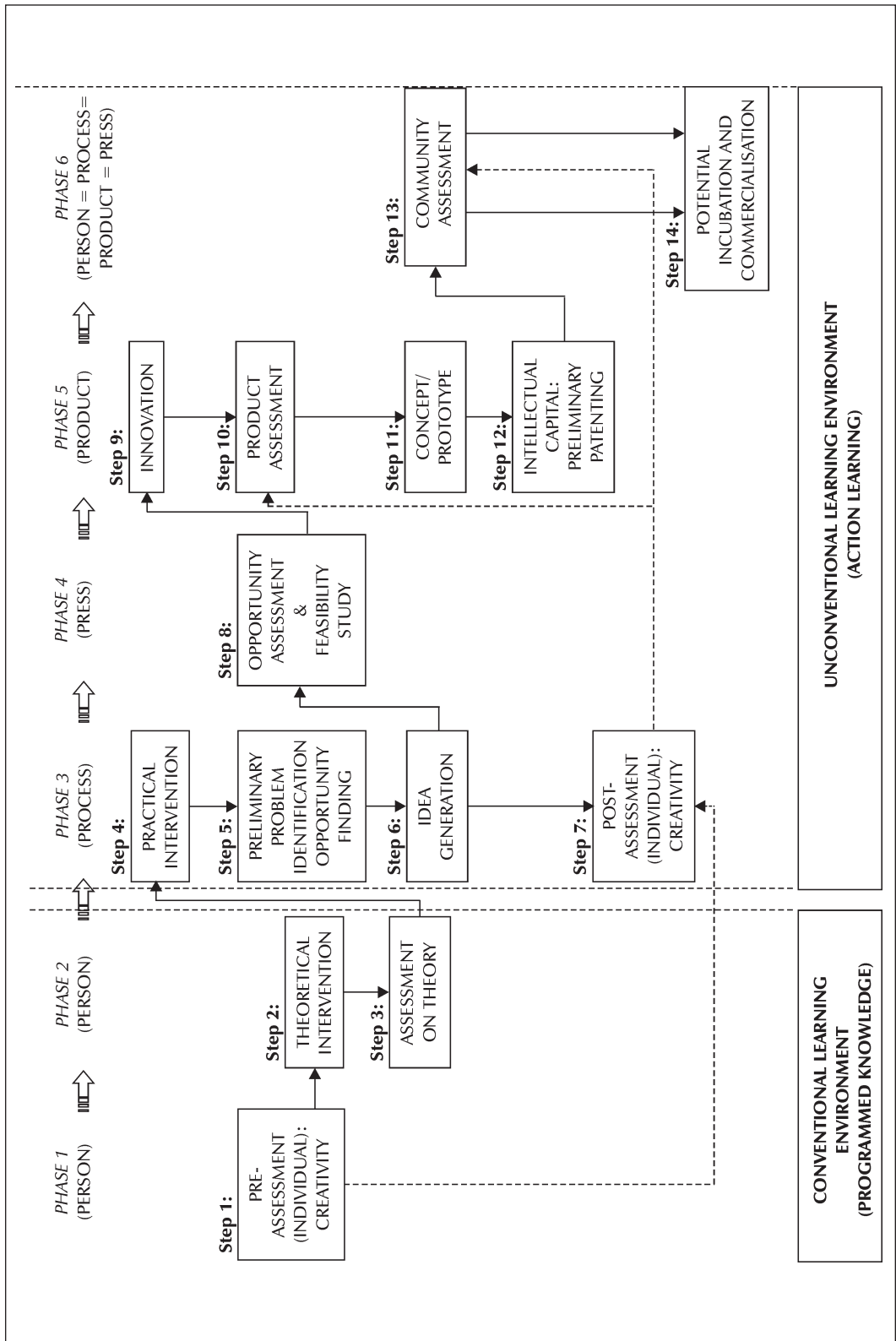
6

Problem statement

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 per cent 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.

Figure 2
The Creativity, Innovation and Opportunity finding training model



- 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.

7

Research objectives

The study endeavours 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 specialisation in Entrepreneurship at the University of Pretoria, South Africa. This module forms part of the E/P = M (E/S x B/S) training model (*The Entrepreneurship training model*) as applied in this programme.

7.1 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.

7.2 Demarcation, scope and limitations of the study

7.2.1 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.

7.3 Importance and benefits of study

The novel nature and short history of entrepreneurship create 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 entrepreneur. 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.

7.4 Research design

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

7.4.1 Experimental design

The study consists 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 of 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* ©, a measurement instrument that tests the likely success of new products, services or processes, serves as the dependent variable or criterion for judgment. 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-attendance of classes, whereby some learners missed out on the process approach as part of the action learning paradigm applied in this programme.

7.4.2 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 and 22 years and can to a great extent be generalised as limited business experience. Hence it provides relatively high evidence of internal validity.

7.4.3 External validity

The measurement instrument (*Innovator* ©) was 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.

8

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 undergoing the necessary intervention.

Table 1

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 exists between the three groups in terms of their gender composition (Chi-square = 2.106; p = 0.349).

8.1 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-sales service) and competitive advantage (appearance; function; durability; price; existing competition; new competition and protection).

8.2 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 at 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 in Table 2.

Table 2

Item analysis for the factor: *Effect on Society*

<i>Effect on Society</i>	Cronbach Alpha for the factor = 0.7712
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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 3

Item analysis for the factor: *Business Risk*

<i>Business Risk</i>	Cronbach Alpha for the factor = 0.867
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A particularly high internal reliability is seen for the factor “Business Risk”, with all the items contributing to the reliability.

Table 4

Item analysis for the factor:
Analysis of demand

<i>Analysis of demand</i>	Cronbach Alpha for the factor = 0.822
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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 5

Item analysis for the factor:
Market Acceptance

<i>Market Acceptance</i>	Cronbach Alpha for the factor = 0.707
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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 6

Item analysis for the factor:
Competitive Advantage

<i>Competitive Advantage</i>	Cronbach Alpha for the factor = 0.7712
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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 was decided to include the item in the final analysis. As a summary of 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 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 7

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 interpretation is to conduct a t-test between each of the groups. The results are given in Table 15.

Table 8
Size of the effect: Eta Squared

	Eta	Eta Squared
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 are most significantly found, are 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 9
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	
	t	p-value	T	p-value	t	p-value
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.

8.3 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. However, some differences do appear

to exist between the experimental groups and the control group. 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. 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 10
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 it is, however, clear that high inter-correlation exists between the five factors so that a stepwise procedure would

not include them all, and was therefore not included in this analysis. With regards to the prediction of group membership, table 11 classified the results as follows:

Table 11
Classification results

ClassificationResults(a)					
		Group	Predicted Group Membership		Total
			Exp.	Control	
Original	Count	Exp.	87	4	91
		Control	28	22	50
	per cent	Exp.	95.6	4.4	100.0
		Control	56.0	44.0	100.0
a 77.3 per cent 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.

9

Conclusion and recommendation

The first step in the data analysis 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.

9.1 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 and consistency, and all items contribute fairly well to each factor.

9.2 Demographic analysis

The following table summarises the demographic findings of the study:

Table 12
Demographics

Gender	<ul style="list-style-type: none"> No significant difference (Chi-square = 2.106; $p = 0.349$). Gender composition: 40 per cent female and 60 per cent male.
Age	<ul style="list-style-type: none"> Age does not correlate significantly with the scores on the factors of the Innovator ©.
Home language	<ul style="list-style-type: none"> Four groups: Afrikaans, English, African and Foreign (German, Chinese and French). 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 ©.
Race composition	<ul style="list-style-type: none"> Significant differences exist in the race composition of the respondents. Experimental group 1: 86.4 per cent Caucasian composition; Experiment group 2: 76.8 per cent Caucasian and the Control group: 54.2 per cent Black composition The significance is stated by a Chi-square of 28.42 and $p = 0.000$.
Degree enrolled for	<ul style="list-style-type: none"> Experimental group 1: Entrepreneurship as a degree of specialisation. Experimental group 2: Sundry of commercial degrees, entrepreneurship as an elective module. The Control group: A diverse number of commercial degrees

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. Experimental group 1 formed part of the first entrepreneurship students taking the degree in entrepreneurship, and creativity, innovation and opportunity finding *per se*. Experimental 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.

9.3 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:

This proposition is accepted based on the analysis of Table 7 (ANOVA) where experimental group 1 exhibits significant differences in factor results compared to the control group.

Proposition 2:

From the results obtained in Table 7 (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:

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:

The proposition proposed is rejected. The results from the study show that experimental group 1 does not present a significantly higher score on the likely commercial success of innovations than experimental group 2.

Proposition 5:

This proposition is rejected based on the findings illustrated in Table 7 (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 per cent is achieved.

9.4 Recommendations

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 have 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 therefore 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 therefore 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.

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