

# **CONNECT OR DISCONNECT: THE INFLUENCE OF TECHNOLOGY-ENABLED UNIVERSITY SUPPORT SERVICES ON ENTREPRENEURIAL INTENTIONS**

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## **Abstract**

The purpose of this paper to describe the entrepreneurial intentions of South African university students and to determine the influence of university information technology-enabled support services (ITeS) on their entrepreneurial intentions. A cross-sectional web-based survey was conducted from August to November 2008 and 2203 university students participated. The results indicate that more than half of students consider an entrepreneurial career more than five years after graduation and even though they regard ITeS as important, few make use of more than contacts, business plan and entrepreneurship seminars and lectures.

## **Introduction**

Entrepreneurship has become the new dogma of the 21st century. It has been promoted as a career choice, entrepreneurs are profiled as heroes in the popular business press, and governments encourage entrepreneurship as the solution to economic growth and job creation (Verreynne & Scheepers, 2008). However as career choices go, becoming an entrepreneur is one of the most risky, unstructured and probably rewarding choices students can make.

Despite these risks, research studies in recent years (based on the Global Entrepreneurship Monitor-reports) have shown a strong relationship between education and enterprise creation (Von Broembsen et al., 2005). Individuals with tertiary education have the potential to create sustainable enterprises, which survive beyond the “three year crunch” and tend to create more jobs, compared to individuals with secondary or primary education. These findings are supported by earlier research (Robinson & Sexton, 1994) which indicated that the self-employed more often have a formal university education, compared to people in wage and salaried employment.

Technological developments in education have led to more Information Technology enabled support Services (ITeS) that can be offered to students. ITeS is one of the major drivers of growth in the global IT Industry and adds value to entrepreneurs in most industries (Arnold, 2007). Universities all over the world also make use of these support services in different ways. ITeS can also be utilised

to facilitate and promote entrepreneurship within universities. The rationale behind offering ITeS to students who intend becoming entrepreneurs, are to provide students with learning materials for their entrepreneurship modules, offer simulations, mentorship and provide networking opportunities.

The need for entrepreneurship is especially relevant in developing countries, such as South Africa (SA). In the current SA economy it is estimated that more than 8 million people will be unemployed by 2010, therefore SA is in dire need of high potential entrepreneurial ventures, which create jobs and wealth (Nieuwenhuizen & Groenewald, 2008). Thus, the entrepreneurial career intentions of university students are especially important to analyse, since university educators can adapt curriculum offerings to the needs of students, and improve technology-enabled support services. The purpose of this paper is to determine the entrepreneurial intentions of SA students and determine how intentions are influenced by university ITeS.

## **Literature Review**

Various reasons are offered as to why individuals start and build their own businesses. Among the leading motives cited are the desire for independence, the challenges of creating and building a business and the profit motive (Rwigema & Venter, 2004, p.13). On the one hand these three motivations often lead to the creation of opportunity-based business, anchored in a real market problem or growing need, “pulling” individuals to start businesses. On the other hand entrepreneurs may also be “pushed” into entrepreneurship by poor prospects and disillusionment with their current employer, the lack of innovation within their current employer’s business or through negative displacement or lack of alternatives, such as retrenchment and corporate downsizing (Rwigema & Venter, 2004, p. 13).

Today’s students are tomorrow’s potential entrepreneurs, however there is limited understanding of the factors which affect students’ career expectations and intentions to become entrepreneurs (Basu & Virick, 2008). For students, the decision to start a business reflects a process in which attitudes and intentions evolve based on the development of individual skills, experiences and relations to the business context (Davidsson, 1991; Katz, 1992).

## **Entrepreneurial Intentions**

Intentionality is rooted in socio-psychology theories of behaviour, based on the premise that much of human behaviour is planned and therefore preceded by intentions towards that behaviour (Basu & Virick, 2008). Intentions are a proactive commitment to bring about future actions, not just an expectation of future actions

(Bandura, 2001). Furthermore in cases where behaviour is difficult to observe, rare, or involves time lags, intention is seen as an accurate predictor of planned behaviour (Fishbein & Azjen, 1975). Entrepreneurial behaviour is an example of such behaviour and thus several empirical studies of entrepreneurship have applied the theory of planned behaviour (Kolvereid & Isaksen, 2006; Urban, 2006). Krueger et al. (2000) assert that entrepreneurial activity can more accurately be predicated by studying intentions, rather than studying personality traits, demographic characteristics, or situational factors.

Two intention-based models that are widely recognised in the entrepreneurship intention-field of research and offer a well-developed theoretical basis for intention based research are: Ajzen's (1991) theory of planned behaviour (developed and validated in social psychology) and Shapero's (1982) model of entrepreneurial event (not well tested). The theory of planned behaviour contends that intentions are a function of three sets of factors: attitudes, subjective norms, and perceived behavioural control (also known as self-efficacy). Attitudes are defined as beliefs and perceptions regarding the personal desirability of performing the behaviour, which are in turn related to expectations regarding the personal impact of outcomes resulting from that behaviour (Ajzen, 1991). Subjective norms or perceived social norms are defined as individuals' perceptions about the values, beliefs and norms held by people whom they respect or regard as important and the individuals' desire to comply with those norms. Krueger et al. (2000) argues that the intentions of individuals with a high internal locus of control are less influenced by social norms. Perceived behavioural control (PBC) or self-efficacy is defined as the personal belief that one can execute planned behaviour and the perception that the decision-maker has control over the behaviour (Basu & Virick, 2008).

Applying the theory of planned behaviour to entrepreneurship, entrepreneurial intentions are viewed as being dependent on an individual's attitude toward the desirability of an entrepreneurial career, subjective norms, including perceived family and other role models expectations and beliefs to perform the behaviour, as well as the perceived ability to execute the intended behaviour of entering entrepreneurship (PBC) (Basu & Virick, 2008; Urban, 2006). PBC has been shown to be influenced by prior experience, especially entrepreneurship education (Noel, 1998).

### **Influence of Education in Shaping Entrepreneurial Intent**

Student career expectations are influenced by a variety of factors such as the changing career world, characteristics of various careers, financial factors, education-related factors, family background and role models (Kroon & Meyer, 2001; Von Broembsen et al., 2005). Entrepreneurship educators are often urged to consider how their modules and approach to teaching entrepreneurship can

influence students' attitudes and intentions towards entrepreneurship (Kroon & Meyer, 2001; Nieuwenhuizen & Groenewald, 2008).

Earlier empirical work of Owusu-Ansah and Fleming (2002) and Ibrahim and Soufani (2002) found that entrepreneurs, who participated in entrepreneurship courses exhibited higher tendencies to start their own businesses compared to those attending other business courses, or not attending any courses. Ladzani and Van Vuuren (2002) share this view, by highlighting the pivotal role training plays in supporting small businesses. They propose that entrepreneurship education is essential for starting and managing a business and therefore it has a powerful influence on entrepreneurial intentions.

While some may argue that tertiary entrepreneurship courses are too theoretical, Sullivan (2000) found that entrepreneurs believe that the foundational knowledge gained by participating in academic courses were valuable, when confronted with "real life" incidents. Explicit knowledge of entrepreneurship concepts enabled graduates to cognitively reflect on the incidents and determine what learning took place. In other words the ability to dissect, reflect, learn and act on a critical incident was seen to be of great importance (Nieuwenhuizen & Groenewald, 2008). Therefore it is expected that education can positively influence entrepreneurial intentions.

### **Technology-enabled Support Services For Entrepreneurship**

Information Technology enabled support Services at universities could potentially enhance the entrepreneurial intentions of students. Several examples of university partnerships, supported by ITeS can found globally. For example in the United Kingdom the *SET squared Partnership* is enterprise collaboration between UK Universities of Bath, Bristol, Southampton and Surrey. The Partnership supports the creation of new technology businesses and licenses from its research base and the local community as well as facilitating industry-academia collaborative research and providing enterprise education and training to its researchers and entrepreneurs. In the last three years four SET squared Partnership companies have achieved IPOs, with a total market cap of £160 million and 170 early stage technology companies have been supported through its Business Acceleration Centres (Brooks & Smailes, 2009). The Triple Helix<sup>1</sup> concept focuses on the role of Industry, Universities and Government relationships in creating new high tech businesses. Classic examples are the Boston area with its universities and high tech industry, and the Stanford/Northern California area in the USA.

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<sup>1</sup> This concept refers to the relationships between industry, universities and government.

Another example is ATP Innovations. ATP Innovations, owned by four of Australia's top universities, is a leading technology business incubator and accelerator that support emerging businesses in the biotechnology, ICT and electronics sectors. Though their subsidiary company bizCapital, matching funds for pre-seed investments are available for early stage ventures. Additional skills development programs are offered through Enterprise Workshops, which provides emerging companies the opportunity to test their business case through intensive team-based business plan workshops. Located within the Australian Technology Park, ATP Innovations supports Australia's largest cluster of emerging technology businesses (Hawthorn, 2007).

SA universities also facilitate entrepreneurial development of students by offering various services such as technology transfer, commercialisation advice, business development services, incubators, start-up financing, contacts for general questions, and founder exchange experiences. University-industry partnerships also offer start-up games and business simulations, such as First National Bank Universities Business Challenge (FNB UBC), that encourage future entrepreneurs to achieve their full potential. Additionally Management departments offer entrepreneurship seminars and lectures, business plan projects and start-up coaching through the classroom and virtual environments. Therefore, university ITeS can influence students, through socialisation into entrepreneurship as a possible career path (Kolvereid & Moen, 1997).

## **Methodology**

The purpose of this paper is to determine the entrepreneurial intentions of SA university students and determine the relationship between these intentions and university ITeS, facilitating entrepreneurship. To achieve this objective, a cross-sectional web-based survey focused on a sample of South African university students was conducted.

The data set on which the data from this study is based was collected as part of the "Global University Entrepreneurial Spirit Student Survey" (Guesss). This survey focuses on collecting data globally (19 countries participated in 2008), using a standardised web-based questionnaire, translated into English, French and German. Representatives in each country were responsible for approaching relevant universities in each country. Participation was voluntary and students were offered lottery prizes to take part in the survey. Globally 63 580 students in 19 countries took part including 2,203 South African students. Students from the following SA universities took part: University of Stellenbosch, University of the Free State, Nelson Mandela Metropolitan University, University of Johannesburg, Northwest University, University of the Western Cape, University of Cape Town,

and the University of Pretoria. Due to the voluntary participation of students, responses varied between universities.

Data was collected from August to November 2008. The web-based questionnaire focused on assessing students' entrepreneurial intentions, entrepreneurial activities undertaken to date, their individual socio-demographic characteristics and values as well as their university context, based on a scale, verified by Klandt (1984). This paper draws on the data of entrepreneurial intentions, some socio-demographic variables and the university context, specifically technology-enabled support services.

## Results

The results presented firstly describes the sample, secondly present descriptive statistics of entrepreneurial intention and university support services and, thirdly, examine the relationships between these variables.

### Sample Profile

The sample of students participating in the study is presented in Table 1. As shown in Table 1 most respondents are young (up to 24 years of age (84.7%)); there are slightly more male (52.8%) than female (47.2%) students; and most students in the sample are busy with their undergraduate studies (86%). In terms of the area of study, the largest portion in the sample is commerce students (38%), then maths, computing and engineering (10.4%); and then life and natural science (8.8%).

Table 2 shows the career choices of the students in the sample directly after their studies, compared to five years after graduation. While the largest portion of students (20.8%) indicated that they would like to work for a large enterprise directly after their studies, another large portion (18%) indicated that they would like to work for a medium-sized enterprise. However when all the different routes to entrepreneurship are considered as a whole, including continuing the family business, taking over an existing business, starting a franchise, continue my own already founded business or starting my own business, more than a fifth (21.4%) indicated they preferred an entrepreneurial career directly after their studies. When their career intentions are considered five years after graduation the picture changes significantly. More than half of the respondents (52.4%) consider an entrepreneurial career, while only 14.9 % of the respondents express their intentions of working for a large enterprise.

Table 1: Characteristics of the Sample

Age of respondents	Number	Percentage	Cumulative percentage
Younger and up to 24 years	1866	84.7	84.7
25 – 30 years	214	9.7	94,6
Older than 31 years	118	5.4	100
Gender			
Male	1163	52.8	52.8
Female	1040	47.2	100
Level of studies			
Undergraduate	1895	86.0	86.0
Graduate (Honours or Masters)	213	9.7	95.7
Post-graduate (PhD)	95	4.3	100
Area of study			
Teacher & Training	72	3.3	3.3
Arts & Humanities	124	5.63%	8.9
Social & behavioural sciences	180	8.2	17.1
Business & administration	836	37.95	55.0
Law	120	5.5	60.1
Life and natural sciences	193	8.8	69.2
Maths, computing and engineering	230	10.4	79.7
Architecture	53	2.41	82.1
Agriculture	71	3.2	85.3
Health Sciences	144	6.5	91.8
Other	180	8.17	100

n = 2203

Table 2: Career Choices

Career options	Directly after studies		5 years after graduation	
	Number	Percentage	Number	Percentage
Working in a micro or small enterprise (0 – 49 employees)	359	16.3	83	3.8
Working in a medium-sized enterprise (50 – 199 employees)	396	18.0	134	6.1
Working for large enterprise (200 and more employees)	459	20.8	328	14.9
Working at university	126	5.7	88	4.0
Working in civil service	87	3.9	38	1.7
Continuing the family business	67	3.0	55	2.5
Taking over or investing in an existing business	141	6.4	302	13.7
Starting or setting up a franchise	55	2.5	108	4.9
Continuing my own already founded business	40	1.8	107	4.9
Starting up my own business	177	8.0	582	26.4
Working part-time (freelance)	72	3.3	198	9.0
Other (including don't know yet)	224	10.2	180	8.2
<b>Total</b>	<b>2203</b>	<b>100</b>	<b>2203</b>	<b>100</b>

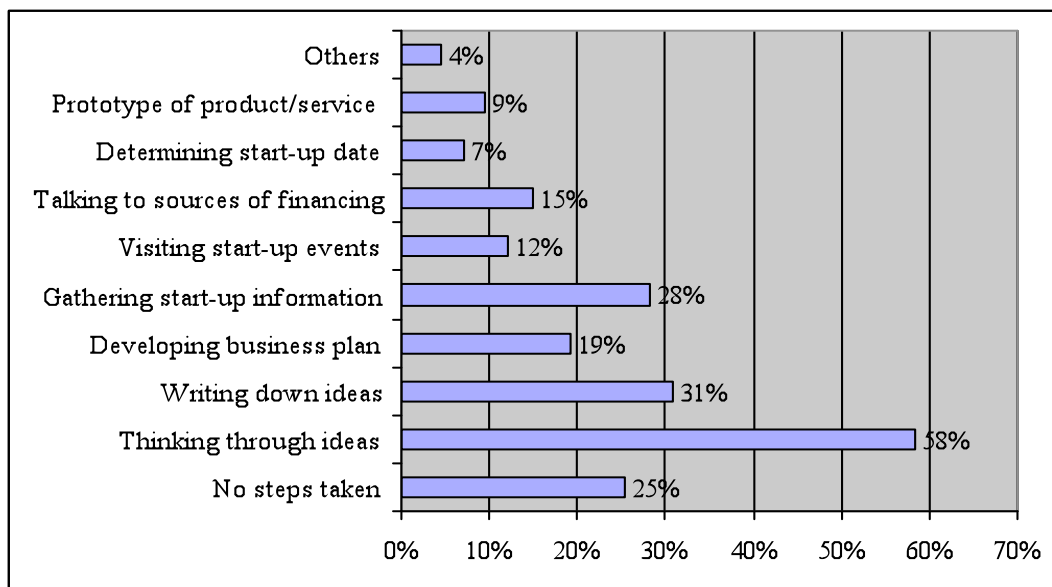
Table 3 indicates how seriously students have considered the possibility of starting their own enterprises. While almost half (47.6%) indicated that they did consider the idea for a short time, but abandoned the idea, a large portion (41.9%) showed their determination to enter entrepreneurship as a career, while only 2.4 per cent reported that they are or were self-employed.

Table 3: Seriousness of Entrepreneurial Intentions

Response	Number	Percentage
No, never	181	8.2
Yes briefly, but I dropped the idea	1048	47.6
Yes I am determined, I'm just starting to do so	922	41.9
Yes, I am already / I was self-employed	52	2.4
Total	2203	100

Figure 1 provides an indication of the steps respondents have taken towards starting a business. While more than half (58%) indicated that they have been thinking through initial ideas, a little less than a third (31%) have written any ideas down, 28 per cent have gathered start-up information, while 19 per cent have worked on developing a business plan. These numbers indicate that while respondents may have thought about getting involved in entrepreneurship, most of them are not currently actively involved with turning this intention into a reality.

Figure 1: Steps Taken towards Starting a Business



Respondents were also asked to indicate how important they viewed Information Technology enabled support Services (ITeS) to facilitate entrepreneurship and if they had made use of these services. From Table 4 it can be seen that respondents viewed contacts for general questions, start-up financing through universities, business plan project seminars, start-up coaching and entrepreneurship seminars and lectures as most important in facilitating entrepreneurship.

Table 4: Importance of University ITeS Facilitating Entrepreneurship

University ITeS	Pretty unimportant	Rather unimportant	Rather important	Pretty important
Business plan project seminars	4.4%	10.8%	24.7%	60.1%
Start-up coaching	4.1%	11.6%	25.1%	59.2%
Entrepreneurship seminars & lectures	4.0%	12.0%	25.0%	59.0%
Start-up games & simulations	6.9%	14.7%	22.9%	51.1%
Regular round tables for founders (exchange experiences)	5.3%	15.3%	26.3%	53.1%
Contacts for general questions	2.6%	9.5%	23.8%	64.1%
Start-up financing through university	6.0%	10.7%	23.0%	60.3%
Incubators (service centres for early start-ups)	4.5%	12.3%	25.9%	52.8%
Others	3.2%	1.7%	3.4%	8.0%

n = 2203

Despite their views of the importance of these ITeS facilitating entrepreneurship, Table 5 shows that relatively few students have made use of these services. The largest number of respondents indicated that they used contacts for general questions (48.7%) and entrepreneurship seminars and lectures (47.4%). Other services also used by more than a third of the respondents were business plan project seminars (38.1%) and founder exchange experiences (34.3%).

Table 5: Use Made of University ITeS Facilitating Entrepreneurship

Made use of service	N	Yes	No
Business plan project seminars	743	38.1%	61.9%
Start-up coaching	439	29.2%	70.8%
Entrepreneurship seminars & lectures	1324	47.4%	52.6%
Start-up games & simulations	371	30.7%	69.3%
Regular round tables for founders (exchange experiences)	332	34.3%	65.7%
Contacts for general questions	1104	48.7%	51.3%
Start-up financing through university	351	24.5%	75.5%
Incubators (service centres for early start-ups)	213	24.4%	75.6%

### Correlation Analysis

Correlation analysis was undertaken to determine the relationship between respondents indicating high entrepreneurial intentions and ITeS. Firstly the relationship between their views of the importance of ITeS and high entrepreneurial intentions were calculated, there-after the relationship between the use of ITeS and high entrepreneurial intentions was determined. The results are shown in Table 6.

Table 6: Pearson Correlations of ITeS and High Entrepreneurial Intentions

ITeS correlated with High Entrepreneurial Intentions	Importance of service				Service used		
	Pearson	p	n		Pearson	p	n
Business plan project seminars	0.155	0.000	2203		0.114	0.002	743
Start-up coaching	0.129	0.000	2203		0.041	0.393	439
Entrepreneurship lectures	0.138	0.000	2203		0.112	0.000	1324
Start-up games & simulations	0.124	0.000	2203		0.009	0.865	371
Founder experience exchange	0.141	0.000	2203		0.081	0.140	332
Contacts for general questions	0.115	0.000	2203		0.036	0.237	1104
Start-up financing	0.093	0.000	2203		0.020	0.714	351
Incubators	0.114	0.000	2203		0.034	0.625	213

$p < 0.05$  = significant

Table 6 reveals that although respondents with high entrepreneurial intentions all regarded university ITeS facilitating entrepreneurship as important and statistically significant, the strength of the correlations is weak. An explanation could be that a number of other factors would have a stronger relationship with entrepreneurial intentions, such as attitudes, subjective norms and self-efficacy; nevertheless the correlations do indicate that universities should offer these services. Additionally although students with high entrepreneurial intentions regard these ITeS as important, only business plan project seminars and entrepreneurship lectures show significant, weak correlations with entrepreneurial intentions. These results seem to suggest that while students may be thinking of entrepreneurship as a career at university, their primary goal is to obtain knowledge and not engage in start-up behaviour.

### Discussion and Conclusion

The findings show that while a fifth of students consider an entrepreneurial career directly after their studies, slightly more than half of respondents consider entrepreneurial careers, five years after graduation, when they have obtained work experience, knowledge of an industry and have established contacts within networks. Even though such a large number of students consider an

entrepreneurial career, few engage in concrete actions steps at present. Most steps taken are just exploratory, such as thinking of ideas and gathering start-up information. Few students proceed to writing business plans or seeking financing. This could be ascribed to the stage of their studies, since most students in the sample are undergraduate students.

When the relationship between entrepreneurial intentions and university ITeS facilitating entrepreneurship is considered, most students regard ITeS as important, however most students only make use of business plan project seminars and entrepreneurship lectures. These results seem to suggest that while students may be thinking of entrepreneurship as a career at university, their primary goal is to obtain knowledge and reduce the risks of an entrepreneurial career, and not engage in start-up behaviour at present.

This study has several limitations that arise from cross-sectional self-reported data. Self-reported data tend to inflate relationships and causality can not be determined using cross-sectional data. Students were incentivised, using lottery prizes; however respondents who took less than 15 minutes to complete the online questionnaire, responses were eliminated. Despite these limitations this study makes a contribution by showing that ITeS can be used to enhance entrepreneurial intentions of students. However ITeS should be used in conjunction with other educational offerings and experiential learning to increase students' attitudes and perceived behavioural control.

### References

- Arnold, M. (2007). *UC Connect*. Retrieved April 9, 2009, from [www.innovationaccess.ucdavis.edu](http://www.innovationaccess.ucdavis.edu).
- Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behavior and Human Decision Processes*, 50, 179–211.
- Bandura, A. (2001). Social cognitive theory: An agentic perspective. *Annual Review of Psychology*, 42, 1–36.
- Basu, A., & Virick, M. (2008). *Assessing entrepreneurial intentions among students: A comparative study*. 12<sup>th</sup> Annual Meeting of the National Collegiate Inventors and Innovators Alliance, Dallas, USA, 79–86.
- Brooks, K., & Smailes, N. (2009). SETsquared Partnership. Retrieved April 9, 2009, from <http://www.setsquaredpartnership.co.uk/about-us/uk-us-science>
- Davidsson, O. (1991). Continued entrepreneurship: Ability, need and opportunity as determinants of small firm growth. *Journal of Business Venturing*, 6, 405–429.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intentions and behaviour. An introduction to theory and research*. Reading, MA: Addison-Wesley.

- Hawthorn, H. (2007). *ATP innovation, the engine room*. Retrieved April 8, 2009, from [www.atp-innovations.com.au](http://www.atp-innovations.com.au)
- Ibrahim, A. B., & Soufani, K. (2002). Entrepreneurship education and training in Canada: A critical assessment. *Education and Training, 44*(8/9), 421–430.
- Katz, J. (1992). A psychosocial cognitive model of employment status choice. *Entrepreneurship: Theory & Practice, 17*(1), 29–37.
- Klandt, H. (1984). *Aktivitat und Erfolg des Unternehmungsgrunders: Eine empirische Analyse unter Einbeziehung des mikrosozialen Umfeldes*. Unpublished Doctoral Dissertation. University of Cologne.
- Kolvereid, L., & Moen, O. (1997). Entrepreneurship among business graduates: Does a major in entrepreneurship make a difference? *Journal of European Industrial Training, 21*(4), 154–160.
- Kolvereid, L., & Isaksen, E. (2006). New business start-up and subsequent entry into self-employment. *Journal of Business Venturing, 21*, 866–885.
- Kroon, J., & Meyer, S. (2004). The role of entrepreneurship education in career expectations of students. *South African Journal of Higher Education, 15*(1), 47–53.
- Krueger, M. F., Reilly, M. D., & Carsrud, A. L. (2000). Competing models of entrepreneurial intentions. *Journal of Business Venturing, 15*, 411–432.
- Ladzani, W. M., & Van Vuuren, J. J. (2002). Entrepreneurship training for emerging SMEs in South Africa. *Journal of Small Business Management, 40*(2), 154–161.
- Nieuwenhuizen, C., & Groenewald, D. (2008). Entrepreneurs' learning preferences: A guide to entrepreneurship education. *Acta Commercii, 128–144*.
- Noel, T. (1998). Effects of entrepreneurial education on intent to open a business: An exploratory study. *Journal of Entrepreneurship Education, 5*, 3–13.
- Owusu-Ansah, W., & Fleming, P. (2002). *The impact of entrepreneurship education on business venturing: A longitudinal survey of Irish graduates*. Paper delivered at IntEnt2001 Internationalizing Entrepreneurship Education and Training Conference. 91–111.
- Robinson, P. B., & Sexton, E. A. (1994). The effect of education and experience on self-employment success. *Journal of Business Venturing, 9*(2), 141–157.
- Rwigema, H., & Venter, T. (2004). *Advanced entrepreneurship*. Cape Town: Oxford University Press.
- Shapero, A. (1982). Social dimensions of entrepreneurship. In C. Kent, D. Sexton, & K. Vesper (Eds.), *The Encyclopedia of Entrepreneurship* (pp. 72–90). Englewood Cliffs, NJ: Prentice Hall.
- Sullivan, R. (2000). Entrepreneurial learning and mentoring. *International Journal of Entrepreneurial Behaviour and Research, 6*(3), 160–175.
- Urban, B. (2006). Entrepreneurship in the Rainbow Nation: Effect of cultural values on ESE and intentions. *Journal of Developmental Entrepreneurship, 11*(3), 171–186.

- Verreynne, M-L., & Scheepers, M. J. (2008, September). *Comparing the entrepreneurial postures of South African and New Zealand firms: A configurational study*. Paper presented at 21st Annual SAIMS Conference, Muldersdrift, Johannesburg.
- Von Broembsen, M., Wood, E., & Herrington, M. (2005). *Global entrepreneurship monitor: South African Report 2005*. Cape Town: UCT Graduate School of Business.