

THE ROLE OF HIGHER EDUCATION INSTITUTIONS IN FOSTERING INNOVATION AND SUSTAINABLE ENTREPRENEURSHIP: A CASE OF A UNIVERSITY IN SOUTH AFRICA

Mathew Kimweli Kimanzi

Central University of Technology

mkimanzi@cut.ac.za

Orcid ID: 0000-0003-2338-6818

—Abstract—

In the new global economy, sustainable entrepreneurship has become a focal point of business as they seek to foster innovation and create sustainable products in the quest towards achieving sustainable development goals by the year 2030. The higher education sector plays a critical role as a catalyst in providing opportunities to nurture young and budding entrepreneurs and creating a platform where entrepreneurs can discover innovations and ideas that can be transformed into sustainable products. The study aimed to find out the role of institutions of higher education in promoting sustainable entrepreneurship, and to establish the characteristics necessary for sustainable entrepreneurs. Quantitative research methods were applied, with self-reporting questionnaires distributed to students at an institution of higher education in South Africa for data collection. Simple random sampling was adopted to select respondents (n=183). The results were analysed using means and exploratory factor analysis. Findings indicated that the institution is providing opportunities for nurturing sustainable entrepreneurship and innovation. Creativity was found to be the characteristic required for being a successful sustainable entrepreneur. The evidence from this study suggests that higher education institutions should be instrumental in creating opportunities and pathways as to how entrepreneurial characteristics can be enhanced to create sustainable businesses. Training should be offered on harnessing creativity and generating ideas that will help solve societal problems, while creating value.

Key Words: Higher education, Innovation, South Africa, Sustainable entrepreneurship

JEL Classification: I2, A2

1. INTRODUCTION

Poverty eradication and creation of employment has become a priority for many governments in developing countries (Youssef, Boubaker & Omri, 2017). Entrepreneurs have been lauded as job creators and leading agents of poverty eradication in these countries, and South Africa is no exception. However, growing interest on business activities towards the society, environment and economy has sparked studies on the need for sustainable entrepreneurship (Badri & Hachicha, 2019; Linder, 2018; Yan, Gu, Liang, Zao & Lu, 2018). According to Hall, Daneke & Lenox (2010), sustainable entrepreneurship is a model of business that focuses on entrepreneurial action that seeks to achieve social benefits, economic viability, and reduction of environmental degradation. For this to be achieved, entrepreneurs are required to have innovative mind-sets; to come up with business ideas that could benefit the society, economy, and the environment (Thompson, Kiefer & York, 2011).

Sustainable entrepreneurship, being a relatively new concept, requires that more information should be disseminated on the effects and opportunities available for young and aspiring entrepreneurs, related to the environment society and economy. Research has shown that young people, and thus young entrepreneurs, are more conscious about sustainability issues compared to the older generation (Goodman, 2012; Kimanzi, 2019). Therefore, higher education institutions, being strategically positioned, can provide great opportunities for these aspiring entrepreneurs to come up with innovative and creative ideas that can be turned into sustainable entrepreneurship (Brazdauskas, 2015).

Several studies around the world suggest that there has been increased interest in the role of higher education institutions in sustainable entrepreneurship (Badri & Hachicha, 2019; Linder, 2018; Asamoah, 2014). However, it has been unclear how higher education institutions promote idea generation and the establishment of sustainable entrepreneurship. For instance, a study by Lans, Blok & Wesselink (2013) discusses the link between education for sustainable development and sustainable entrepreneurship in higher education. Brazdauskas & Zirnele (2018) conducted a study which concentrated on incorporating sustainable entrepreneurship in the curriculum. Adombent, Fischer, Godemann, Herzig, Otte, Rickmann & Timm (2014) studied management education for sustainable development and sustainable consumption in higher education institutions in central and eastern Europe, while Yan et al.'s (2018) research concentrates on personality traits and intentions of starting a business among higher education students.

Although these studies form the core of sustainable entrepreneurship, their main emphasis is on the theoretical part. There is a lack of studies on the role of higher education institutions in provision of opportunities for the creation of innovative and sustainable entrepreneurship among young and aspiring entrepreneurs in developing countries such as South Africa. This forms the main basis of this study.

2. RESEARCH QUESTIONS

The study was guided by the following questions.

- 2.1 What is the role of higher education institutions in the promotion of sustainable entrepreneurship?
- 2.2 What are the characteristics necessary for students to become sustainable entrepreneurs?

3. PRELIMINARY LITERATURE REVIEW

3.1 Characteristics of sustainable entrepreneurs

Sustainable entrepreneurship originates from the concept of sustainable development. Sustainable development has been defined as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (United Nations General Assembly, 1987, p. 43). According to Katsikis & Kyrgidou (2009), sustainable entrepreneurship is “the process aiming at the achievement of sustainable development, by discovering, evaluating and exploiting opportunities and creating value that produces economic prosperity, social cohesion and environmental protection”. Studies have shown that businesses have been known to be the biggest culprits in contributing towards unsustainable behaviour (Casey & Sieber, 2016; Granley & Welo, 2014) and therefore one of the ways of mitigating this behaviour is through encouraging sustainable entrepreneurship.

Sustainable entrepreneurship comprises three components: social, environmental, and economic. The social aspect advocates for business ideas that will help in solving a societal issue, while creating value to the society (Adombent et al., 2016). The environmental aspect is concerned with business practices which aim to sustain the natural resources, while the economic dimension emphasizes the economic viability of the business in order to enhance business survival (Yousef et al., 2017). Lisetchia & Brancu (2014) contend that there are two models of entrepreneurship:

conventional and innovative. Conventional entrepreneurship is based on tradition, where the entrepreneur's main aim is to maximise profits. Innovative entrepreneurship looks at new ways of how to develop an existing enterprise, such as new products or use of new technologies. Sustainable entrepreneurship combines both aspects by being an innovative, market-oriented, and personality-driven form of creating economic and social values by means of sustainable innovations (Shepherd & Patzelt, 2011).

The importance of entrepreneurial characteristics and traits has been emphasized by several authors (Kumaran, Nair & Venumadhav, 2017; Zhang & Bruning, 2011; Chen, Greene & Crick, 1998). For instance, Chen et al. (1998) surveyed students in business administration programs and found that they have a higher entrepreneurial average in terms of innovativeness than other students, and that founders of businesses have higher entrepreneurial innovation and risk taking characteristics than non-founders. In contrast, Kumaran et al. (2017) found that risk takers have a higher success rate compared to innovators in India. They also found that innovation and creativity were positively related to good management skills.

Sustainable entrepreneurship requires that entrepreneurs possess the required characteristics to come up with ideas that can solve problems while creating value. Competencies being proposed to educate students to be sustainable include promoting student creativity and problem-solving skills that could address the world's broad sustainability issues (Brazdauskas, 2015).

A point to note is that innovation forms part of a characteristic and personality trait of the entrepreneur. Notwithstanding, for the creation of new ideas, creativity is required on the part of the entrepreneur, as it is a characteristic required for innovation (Kerr, Kerr & Tu, 2017). Mirela (2014) supports this by arguing that innovation is the main tool of the entrepreneur that is used to exploit opportunities, as it attempts to merge imaginative ideas with current realities in science, technology, and the market. According to Osburg (2014), sustainable entrepreneurs are required to develop innovative business solutions to address the most urgent social and ecological challenges. While doing so, businesses will be contributing to economic development while at the same time improving the quality of life of societies and the environment (OECD, 2018).

According to Chavez (2016), the performance of a new business venture is affected by personality characteristics of the entrepreneur. While this is true for traditional entrepreneurs, it may be different for sustainable entrepreneurs. Hence the need for this study to find out what characteristics are required for sustainable entrepreneurs.

3.2 The role of higher education institutions in the promotion of sustainable entrepreneurship

In earlier years, higher education institutions were being pressured by governments and the private sector to increase their participation in economic development (Etzkowitz & Leydesdorff, 2000). However, there has been a shift towards participation in sustainable development, and therefore higher education institutions are positioned for transitioning students and future business leaders towards a more sustainable future (Arasti, Zandi & Talebi, 2012).

According to Tiemann, Fichter & Geir (2018), the key to successful sustainable entrepreneurship education is to find out the most effective ways to manage skills and complement these with techniques, through higher education institutions. This is evidenced by Fatoki and Oni (2014), who conducted a study on the effectiveness of entrepreneurship education at a selected university in South Africa and found that it does equip students with needed skills to be an entrepreneur. These skills prepare students to become entrepreneurs outside the institution. While this is important, creating opportunities for the establishment of businesses while still studying will create more desirable results (Linder, 2018).

Higher education institutions are capacitated to provide support and skills to entrepreneurs in general, as well as facilitate the transfer of skills to enable current and future sustainability entrepreneurs. According to Thiru (2011), mainstream education is concerned with providing career options and broadening minds, an aspect that is needed to develop sustainable entrepreneurs. Provision of education and skills to entrepreneurs at their initial stages is important for the economy, especially in the 21st century where businesses are directed towards innovation and sustainable entrepreneurship (OECD, 2018).

The role of higher education institutions in creating innovative entrepreneurs cannot be ignored. It is unquestionable that higher education institutions create future entrepreneurs and prepare them for changes in the business world by equipping them with knowledge about sustainable development and opportunities available in innovation. Tiemann et al. (2018) emphasize the importance of higher education institutions by explaining that innovative businesses, whether big or small, have been empowered through collaborations between universities, research organizations, customers, suppliers, business rivals and consumers. Although successful entrepreneurs possess certain desired characteristics, education and skills development is unequivocally important. This is evidenced by Taatila (2010) & Kwiek (2012), whose research found that academically educated entrepreneurs contribute more towards developing economies than entrepreneurs with low

education. In addition, Davidsson (1995) found that there is a correlation between business education and an entrepreneur's ability to start and manage a business. Although entrepreneurship education has benefitted many countries in the past, new programs should be developed by higher education institutions that support the new paradigm shift of sustainable entrepreneurship (Asamoah, 2014). This support should be offered at all stages, from idea generation to inception, incubation and eventually turning the idea into a viable sustainable entrepreneurship, as evidenced by research conducted by Geir & Fichter (2015). Their study found that higher education institutions have support structures that encourage sustainable entrepreneurship. This study was done in Finland, Germany, Sweden, UK and the USA. This therefore calls for a need for a study in a developing country such as South Africa, which has high unemployment rates, to increase employment creation in the country (Turton and Herrington, 2012).

3 METHODOLOGY

This section describes the procedures used in collecting the data that informs the findings.

3.1 Research Design

A research design describes the procedures for conducting the study. It indicates the general plan and the settings of the study (Heumann & Schomaker, 2016). The study used primary methods through collecting empirical information from students at a higher education institution. The study followed a quantitative research design as this method emphasizes objectivity by using numbers and statistics to study the phenomena. A non-experimental design was used to describe the phenomena and examine relationships between different phenomena without any direct manipulation (McMillan & Schumacher, 2010).

3.2 Population and sampling

Population is defined as a group of elements or cases that conform to specific criteria and to which results of the research can be generalized (McMillan & Schumacher, 2010). The target population was teacher education students at a higher education institution in South Africa. This was chosen to promote sustainable entrepreneurship among student teachers, and to develop skills that may be cascaded to other learners when they start practicing.

Sampling is the process of obtaining data from a representative sample of the total population (Cohen, Manion & Morrison, 2011). There are two main methods of

sampling: probability and non-probability sampling. Probability sampling is defined as the act of choosing samples randomly by giving anyone a chance (Struwig, 2001). The study used a simple probability sampling method in order to include any member of the population. This method was helpful as it enables generalization about the population. The method was also preferred in order to get the overall situation of the perspectives from students on the role of higher education in fostering sustainable entrepreneurship. In total, data was collected from 183 participants.

3.3 Data collection and analysis

The study used self-reporting questionnaires as a method of data collection. The self-reporting questionnaires were administered to the respondents at an institution of higher learning in South Africa. These were deemed suitable as the respondents could complete them at their own convenience and in their preferred surroundings (Cohen et al., 2010). The questionnaire consisted of closed-ended questions which comprised general information about the demographics of the respondents. The other parts consisted of five-point Likert scale responses, ranging from strongly disagree, disagree, neither agree nor disagree, agree and strongly agree. The five-point Likert scale was preferred as it includes a clear mid-point which creates an indifferent point, without showing either agree or disagree direction (Riggle, 2014).

Data was analysed and presented using descriptive statistics as well as inferential statistics. Descriptive statistics were used to provide a summary of the existing phenomena by using numbers to characterize students and groups. Factor analysis was used mainly for inferential statistics. Factor analysis is a method of grouping together variables by reducing them to a small number with commonalities. Specifically, exploratory factor analysis was used in this study. According to Heumann & Schomaker (2016), exploratory analysis is used to explore unknown groupings, and to seek underlying patterns, clustering, and groups. Exploratory factor analysis was used to identify and compute composite scores for characteristics of sustainable entrepreneurs. The characteristics that did not contribute to any factor and failed to meet the minimum criteria of a primary factor loading of four were eliminated. Composite mean scores were created for the remaining four factors, based on their means of the items which had their primary loadings on each factor.

4. RESULTS

The data in this section contains information relevant to finding out the role of higher education institutions in fostering sustainable entrepreneurship and the characteristics necessary for sustainable entrepreneurship.

Table 1: The role of higher education institutions in the promotion of sustainable entrepreneurship

The role of the institution in promotion of sustainable entrepreneurship	N	Mean	Std. Dev
The institution is an excellent place to learn how to start one's business	182	3.90	1.075
The institution provides excellent opportunities to use innovation centres and laboratories	181	4.15	.906
The institution arranges competitions for students' business ideas	181	3.55	.951
Lecturers encourage participation in various projects that develop new innovative products	180	3.81	.998
The institution has a well-developed infrastructure that encourages sustainable entrepreneurship	181	3.72	.909

According to Table 1, the results indicated that there was general agreement that the higher education institution provides opportunities for growth and entrepreneurial training. Provision of excellent opportunities to use innovation centres and laboratories was ranked first with a mean of 4.15, while the role of the institution in provision of competitions of business ideas was ranked lowest with a mean of 3.55 out of 5.

Table 2: Importance of sustainable entrepreneurship to students

Motivation for sustainable entrepreneurship	N	Mean	Std. Dev
If I set up a business, it would reduce environmental problems	183	6.86	2.608
If I set up a business, it would help the world's poverty problems	183	7.96	2.362
If I set up a business, it would use natural resources responsibly	183	7.03	2.563
If I set up a business, it would help uplift the society	183	8.54	1.882

Table 2 shows that the social aspect of sustainable entrepreneurship was regarded as the most important reason for sustainable entrepreneurship, with the aim of uplifting the society. This scored a mean of 8.54 out of 10, while businesses started with the aim of reducing environmental degradation were least preferred, with a mean of 6.86 out of 10.

Table 3: Exploratory factor analysis of characteristics of sustainable entrepreneurs

Characteristics of sustainable entrepreneurs	Factor			
	1	2	3	4
Among my friends I am usually the first to try out new idea	.740			
I make comments in class on new ways of doing things	.736			
If my friends were asked, they would say I am brilliant	.559			
I try new ideas and new approaches to problems		.701		
I take things apart to find out how they work		.689		
I like to work on a problem that has caused others great difficulty		.660		
I will leave a job/task that does not challenge me			.710	
I usually support a friend's suggestion on new ways of doing things			.646	
I rarely stick to the rules or follow procedures				.811
I can be counted on by my friends to find a new use for existing methods or existing equipment				.538

Table 3 shows results from the exploratory factor analysis of characteristics of sustainable entrepreneurs. The results indicate that the factors in common were categorised in four main characteristics: risk taker, creativity, determination and problem solver (Table 3). Factor 1 comprised 3 items reported on a 5-point Likert scale that explained 69% of the variance with factor loadings from 0.559 to 0.740. Factor 2 comprised 3 items reported on a 5-point Likert scale that explained 69% of the variance with factor loadings from 0.660 to 0.701. Factor 3 comprised 2 items reported on a 5-point Likert scale that explained 69% of the variance with factor loadings of 0.646 and 0.710. Factor 4 comprised 2 items reported on a 5-point Likert scale that explained 69% of the variance with factor loadings of 0.538 and 0.811.

Table 4: Personal characteristics of aspiring sustainable entrepreneurs

	N	Mean	Std. Deviation
Risk-taker	183	3.4499	.75071
Creativity	183	3.9262	.58902
Determination	183	3.4727	.79096
Problem solver	183	3.6011	.80650

The factor scores from Table 3 were further computed as means to ascertain the most desirable characteristic (Table 4). Factor 1 items were categorized as risk

takers, factor 2 items were categorized as creativity, and factor 3 items were categorized as determination while factor 4 items were categorized as problem solvers. The results indicate that creativity emerged as the desired characteristic of sustainable entrepreneurs, with a mean of 3.92 out of 5, followed by risk taking with a mean of 3.44, problem solver with a mean of 3.60, and lastly, determination, with a mean of 3.47.

5. DISCUSSION

The discussions are based on the objectives of the study, which were mainly to find out the role of higher education institutions in fostering sustainable entrepreneurship and the characteristics necessary for sustainable entrepreneurship.

5.1 The role of higher education institutions in promoting sustainable entrepreneurship

The study found that the higher education institution provides opportunities for sustainable entrepreneurial training and development for its students. In particular, the institution provides opportunities to use innovation centres and laboratories. This is a clear indication that higher education institutions are promoting sustainable entrepreneurship in developing countries, such as South Africa. These findings correspond with findings by Geir & Fischer (2015) in Finland, Sweden, UK, and USA. This shows the involvement of higher education institutions in aligning with the 2030 vision of the United Nations' sustainable development goals, through playing their role in supporting sustainable entrepreneurship.

In addition, the fact that respondents are aware of these opportunities is an indication of their interest in entrepreneurship as well as sustainable entrepreneurship. This is an encouraging result, taking into cognisance that entrepreneurship and innovation are correlated (Maradina et al., 2017). Therefore, higher education institutions can capitalize on this information, by creating a platform for successful businesses for students. They can also market and develop the institutions by creating patents for the business ideas presented by the aspiring entrepreneurs. To remain competitive in the global world, support in areas of creation of innovative products and ideas is required, especially in South Africa, as evidenced in this study. It has been emphasized (OECD, 2018) that new businesses boost economic growth.

Interestingly, there was agreement on the role of lecturers in encouraging participation in entrepreneurial projects. This shows a change in mind-set and adaptation to new ways of contributing to the economy, rather than preparing students to become career orientated. The study also found that the institution is an

excellent place to learn how to start a sustainable business. This concurs with studies by several authors (Tiemann et al., 2018; Arasti et al., 2012; Fatoki & Oni, 2014; Taatila & Kwiek, 2012) on the importance of higher education institutions in the provision of sustainable entrepreneurship.

Although the results show positive effects of higher education institutions on sustainable entrepreneurship, there were doubts on the availability of infrastructure for sustainable entrepreneurs. The areas of concern here could imply avenues of funding and venture capital as well as availability of enough facilities where sustainable innovation could take place. There were also concerns about the lack of competitions for the most successful innovative business ideas. This is an area that should be encouraged, in that although higher education institutions harness the skills, showcasing innovation among these aspiring entrepreneurs can help motivate, and create opportunities for interdisciplinary learning from what others have done.

5.2 Characteristics necessary for sustainable entrepreneurs

Sustainable entrepreneurship requires coming up with businesses that are aimed at solving problems related to the economy, society and the environment while creating value. For this to be achieved, a person is required to have particular characteristics. Results from the study indicated that creativity was the leading characteristic most portrayed by sustainable entrepreneurs. This concurs with studies by Mirela and Osborne (2014). For innovation to take place, the sustainable entrepreneur must possess creativity. For creativity to be turned into innovative ventures, higher education institutions can provide the required skills to encourage participation of these students in establishing innovative and sustainable entrepreneurship. It is interesting to find out that problem solving was the second rated characteristic of the students. This goes hand in hand with creativity in that the world requires solutions to economic, social, and environmental problems, as argued by Brazdauskas (2015) and Osburg (2014). Entrepreneurs are required to have the relevant skills to come up with ideas that can help solve unemployment, social ills, illiteracy, environmental degradation and other societal problems while enhancing sustainable development (Shepherd & Patzelt, 2011; Hall et al., 2010.).

On the other hand, risk taking was the trait least required to become sustainable entrepreneurs. This is not surprising, as it concurs with studies by Chen et al. (1998) who found that the founders of businesses have a higher entrepreneurial self-efficacy in innovation and risk taking as compared to non-founders. This is applicable in this study in that most of the students have not yet founded their businesses, so they are not prepared to take risks. In contrast, a study in India by

Kumaran et al. (2017) showed that risk takers have a higher success rate than innovators.

6. IMPLICATIONS AND RECOMMENDATIONS

The main aim of the study was to find out the role of higher educational institutions in the promotion of sustainable entrepreneurship. The study found that higher educational institutions are promoting sustainable entrepreneurship through provision of opportunities to use innovation centres and laboratories but are lacking in arranging of competitions for the most successful innovative business ideas. It is recommended that higher education institutions should seek to provide collaboration with businesses in order to create an enabling environment for research on innovation in areas of sustainable entrepreneurship. The collaboration with business should help in mentoring and coaching aspiring sustainable entrepreneurs as well as opening opportunities for work-integrated learning and training of these young sustainable entrepreneurs.

Secondly, the main characteristic of the sustainable entrepreneur was found to be creativity and innovation. It is recommended that higher educational institutions should focus on coming up with ways of harnessing these skills, for the purposes of developing sustainable products. Special training should also be offered on ideas that will help solve societal problems while creating value, since the respondents indicated that they are interested in starting businesses that will help uplift the society.

7. CONCLUSIONS AND AREAS OF FURTHER RESEARCH

The study was carried out to establish the role of higher education institutions in fostering innovation and sustainable entrepreneurship, and to establish the characteristics necessary for sustainable entrepreneurs among students. The study determined that higher education institutions provide excellent opportunities to use innovation centres and laboratories, and aid in idea generation by sustainable entrepreneurs. Creativity was found to be the most inherent characteristic required for successful sustainable entrepreneurship, and that the need for society's uplifting was the main reason as to why aspiring entrepreneurs would like to venture into sustainable entrepreneurship.

Further research could be conducted with students who have started with their sustainable entrepreneurship projects; to identify their products, processes and the benefit that their projects will offer to the economy, society and the natural environment.

8. LIMITATION OF THE STUDY

The study was a case study which only focused on one higher education institution in South Africa, and the data was collected from students in one faculty rather than the university in general. Therefore, these results cannot be generalized to the entire institution.

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