AOSIS

Knowledge transfer: Graduates' capability to demonstrate and produce business innovation

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Background: The age of information has given rise to the demand for higher education institutions (HEIs) to produce graduates capable of producing innovation and ultimately contribute to improving the South African (SA) economy.

Objectives: The objective of this study is to determine whether graduates who enter the business environment demonstrate the knowledge and capability to produce business innovation through knowledge and skills acquired in HEIs.

Method: An online questionnaire, was used to collect data from 69 of the 100 participants from the South African Business Innovation Community (Innovation Summit) (SABIC) and the Innovation, Sustainability and Visionary Leadership Group (ISVL). The demography ranged from company representatives, government representatives, entrepreneurs, academics, etc. Data were collected were analysed through inferential statistical analysis with the support from Statistical Package for Social Sciences (SPSS).

Results: Based on the findings, an equal distribution exists between seldom and often, which indicates tension about whether graduates seldomly demonstrated the ability to produce effective business innovation or whether they often demonstrated the ability to produce business innovation.

Conclusion: Higher education institutions play a vital role in preparing graduates for the world of work by transferring knowledge. It is therefore significant for HEI's to transfer knowledge and skills that improve graduates' capability to innovate, think critically and solve complex problems and contribute to the SA economy.

Contribution: Given the state of youth unemployment there is a need for universities to produce graduates capable of effective innovation. This article focused on determining whether graduates possess the knowledge and capability to produce business innovation from the knowledge and skills transferred by HEIs.

Keywords: knowledge transfer; capability; graduates; problem-solving; business innovation; signification framework.

Introduction

The information age gave birth to the Fourth Industrial Revolution (4IR) and in addition created more values to higher educational institutions (HEIs) as the main source of knowledge, skills and innovation (Overton-De Klerk 2016:1). Higher education institutions also play a significant role in equipping students with knowledge and skills relevant to the contribution of a country's growth through teaching and learning (Eletter, Refae & Kaba 2020:13; Matli & Ngoepe 2021; Perkmann et al. 2013:423). Many organisations struggle to acquire graduates with the skills and knowledge to contribute to their environments and improve business innovation. Many graduates require additional reskilling to properly fit and be successful in the world work (Mhlanga 2021:13; Shane 2012:160; Sibanda 2021:30). Higher education institutions are required to produce graduates with sufficient skills and knowledge to contribute to the world work, further develop industries through business innovation and contribute to the growth of country's economy. The information age along with the 4IR has given value to the field and discipline of information and knowledge management (IKM). The information management (IM) discipline has a role to play in contributing to the country's economy through its principles and toolkit that focus on innovation and competitiveness. The ability of an HEI to produce effective business innovation has taken precedence in the last decade and the practice of

transferring critical knowledge to students has proven to be significant in improving university graduates' knowledge and capability to demonstrate and produce effective business innovation.

This has given rise to the IM discipline, which can aid universities in acquiring and transferring quality knowledge to identify realistic commercialisable innovation. Hence the purpose of this research article is to determine whether university graduates who enter the business environment demonstrate the knowledge and capability to produce effective business commercialisable innovation through university-transferred or acquired knowledge and critical skills. The purpose was to further develop an intervention key to aid in and assist HEIs and students with the right knowledge and skills when needed.

Literature review

Innovation has historically been an interesting area for both the researchers at HEIs and research and development staff from various industries. The way innovation is defined by an organisation will determine the various activities that will be performed by the organisation itself (Popa, Preda & Boldea 2010:151). Defining innovation will determine the nature or type of innovation that will take place within an organisation. Therefore innovation, as per the innovation process, is always influenced by the way an organisation defines innovation and the knowledge acquired and the processes.

Innovation of business products and services

The ability of an individual and organisation to innovate is determined by the continuous transformation of knowledge and ideas into valuable products to the world (Popa et al. 2010:151). It is important to understand what an innovator is; innovators are driven by change and seeing improvement in the world in which they exist (Selman 2002:2). An innovator can be described as an individual who is focused and geared towards creating new real-world realities through inventions and bringing them to existence (Selman 2002:9). The development of new ideas and innovations has become one of the most important areas for organisations to have an impact. Therefore, it is important to clearly define innovation, the different types of innovations and the various characteristics of innovation.

According to Evans (1991) and Popa et al. (2010:152), innovation is the capability to determine new ways of doing things, new perspectives and to combine existing concepts, to create new products. Additionally, innovation is described as the implementation of significantly new and improved products or new business processes, business methods and tools (Rooke 2017; Soltanifar, Hughes & Göcke 2021). For a product to be classified as innovation, it must be new or significantly better (Tiwari 2008:1). Innovation is classified in different types of which the main types are described in the Product innovation section.

Product innovation

Product innovation is the type of innovation that refers to the introduction of a new product or a new service that is significantly improved through new functions, features and characteristics (Tiwari 2008). This consists of the improvement of feature specifications of products and includes new software that has been improved through better usage and better functionalities. Product innovation can use new technologies and knowledge, or even based on the production and utilisation of existing technologies and knowledge that are considered an improvement of existing products or services.

Process innovation

This type of innovation focuses on the implementation of unique and important improvement on the production or supply methods (Tiwari 2008). Innovation is often geared towards improving processes for cost effectiveness of an organisation in terms of production and processes. This type of innovation can help an organisation to improve the products and the delivery of these products.

Marketing innovation

This type of innovation is geared towards customer satisfaction, company positioning in the market and exploring on new markets to improve sales (Tiwari 2008). Marketing innovation is the adoption of new marketing processes involving that which consists of important changes in the development and designs of products, the placements and packaging and advertising and prices (Persaud, Wang & Schillo 2021).

Organisational innovation

Organisational innovation focuses on producing new organisational-related methods that are geared towards best business practices, organisational workplace and the organisation's relationship with external companies (Tiwari 2008). This type of innovation focuses on improving organisations' human agility, performance and competitive advantage through cost effectiveness in relation to administration, transactions, improving organisational culture and cutting supply-related costs (Thani et al. 2021). Innovation heavily relies on the knowledge acquired by an individual and organisation. Hence the practice of knowledge transfer is important and HEIs need to monitor and evaluate the knowledge transferred to graduates to ensure graduate readiness for industry world of work and be able to produce business innovation.

Knowledge transfer

Knowledge transfer can be defined as the process undertaken to diffuse and convey knowledge to an individual or a group of individuals within a setting. This can be achieved through personal contact, meetings and training. Knowledge can be transferred through various means, for one knowledge can be

tacit or explicit. Tacit knowledge can be transferred through personal and individual collaboration and communication. Whereas explicit knowledge can be transferred by means of databases, books, technology and archives. In most cases, knowledge is transferred through training with the hope to ensure that knowledge gained can be actionable and applied in real-world context (Thomas & Pretat 2009:21).

The best way to understand the value of knowledge transfer is to understand its goal. The goal of knowledge transfer is to ensure that knowledge is passed from individual to another to ensure action from the acquired knowledge. Training enables an individual to replicate the skills and competence transferred by the source of knowledge. Knowledge transfer aims to ensure that an individual can provide solutions to problems and can also create good entrepreneurial ideas. This also includes the process of fertilisation where problems and solutions are unknown; this creates space for entrepreneurial mindset, innovativeness and creativity (Albino, Garavelli & Gorogoglione 2004:590). Higher education institutions play a very significant role in ensuring the knowledge transfer.

Entrepreneurial universities

According to experts from the Entrepreneurship360 stakeholder community of the Organisation for Economic Co-operation and Development (OECD), understanding what an entrepreneur is and what entrepreneurship entails are significant to put the concept of entrepreneurial universities into context (Lackéus 2015). An entrepreneur is a person who takes pride in the ownership of various market-related products and services (Johnson 2001:137). Entrepreneurs are life-long learners, they like to make things happen and take risks and they are responsible (Soltanifar et al. 2021; Urban & Gaylard 2014). Entrepreneurs are responsible people involved in the process of business development activities and have the passion to see the goals and mission through (Lackéus 2015). Some of the key behaviours of entrepreneurs consist of the ability to be motivated to function in competitive industries and achieve goals. Entrepreneurs are open to learning and acquiring new knowledge; they take calculated risks and can impact a certain market (Johnson 2001:137).

Entrepreneurship can be defined as an act of being creative and building products that do not exist and taking opportunities that are related to business markets (Liu et al. 2020; Soltanifar et al. 2021). Furthermore, entrepreneurship involves the creation of ideas and designing products from those ideas and taking the business venture to the industry or market (Johnson 2001:138). The concept of entrepreneurship is related to innovation and the ability to turn innovation into business ventures, and innovation is enhanced through entrepreneurial activities. The idea of entrepreneurial organisations is derived from the context of the capability to create knowledge and to turn the knowledge into products in order to improve the economy and societies at large (Jameson & O'Donnell 2015:70).

Research methods and design

This article is part of a PhD study that was conducted with the aim to develop a strategic information management (SIM) system to facilitate the process of innovation and commercialisation of an entrepreneurial university's innovators' commercialisable ideas (see Appendix 1). The value of the system is its intervention keys to act as a safety net to assist student innovators in converting their business ideas into commercial products and services. The purpose of this article is to determine whether graduates who entered the business environment demonstrated the ability to produce effective business innovation through knowledge acquired and critical skills. The ontological assumption for this research article is pragmatism; this is because of the practical nature of the research. According to Saunders, Lewis and Thornhill (2016:136–137), pragmatism allows the study to explore what can work in the real world and determine whether graduates do possess the practical skills and knowledge to produce effective business innovation. A signification framework methodology was used for this research, which refers to the process of creating an underlying structure used for the representation of meaning that is generally applied in sensemaking, sensegiving, knowledge sharing, leadership, narrative and decision making (Deprez & Hanchar 2017; Magoma 2018; Namvar, Intezari & Im 2021). A signification framework is the basic structure underlying a system, concept, text or narrative (Du Toit 2003; Jakubik 2021; Snowden 2011).

In this research article, Figure 1 presents the general interpretation of the intervention keys for each of the five elements of this study's signification framework. Thereafter, the application follows in subsequent figures. The five elements in Figure 1 are:

- *Presume*: To suppose that something is the case based on probability or likelihood, for example, business innovation experts in Africa believe that a shift in value is the likely result of newly added components.
- *Predict*: To say or estimate that a specified thing will happen in the future or will be a consequence of (a specific thing), for example, competition will increase because of innovation.
- *Prize*: To value a specific thing as extremely valuable, for example, business leadership is most advantageous in a competition business environment.
- *Perceive*: To interpret or regard a specified thing in a particular way, for example, innovators are energised by the action and buzz of creativity.
- *Produce*: To lead to or cause a specified thing to happen or exist, for example, active teaching leads to active learning.

A retroductive research strategy combined with action research was used for this study. The practical nature of this research is to determine whether graduates do possess the practical skills and knowledge to produce effective commercialisable business innovation. Retroductive research aims to discover various underlying mechanisms and instruments that explain different observed regularities
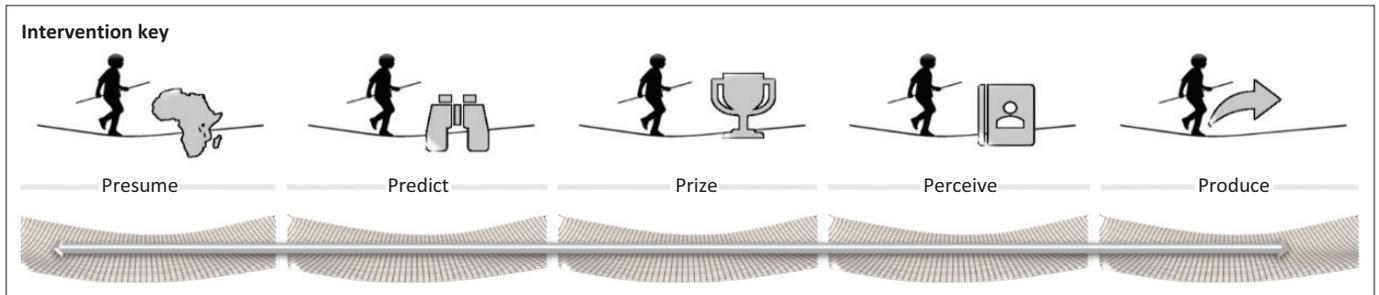
FIGURE 1: Intervention keys.

in particular contexts (Malhotra 2017:173). The process includes developing a hypothetical approach of systems and structures that are deemed to produce empirical phenomena. This involves a revisiting your data to reach a possible explanation and the process of observing a phenomenon and then stating what gave it value (Malhotra 2017:174). This involved the development of theory, which was subject to testing through practical application of the SIM system intervention keys seen in Appendix 1. For the purpose of this article, only one intervention key is presented (Saunders, Lewis & Thornhill 2012:125).

The PhD study utilised a mixed-method approach: for this article only, the quantitative research approach is utilised along with the qualifying data. Data for this research article were collected from 100 delegates from the South African Business Innovation Community (Innovation Summit) and the Innovation, Sustainability and Visionary Leadership Group. An online questionnaire was used as the data collection instrument, and a 69-response rate was obtained (Appendix 2). The demographic of this audience includes company representatives, government representatives, chief executive officers, managing directors, entrepreneurs, academics, company founders, board member, business analyst chief of section, chief operating officer, creative director, filmmaker and editor, lead consultant, learning manager, mentor and ambassadors, vice chairperson of the Northern Lights Northern Conference of South Africa's Youth Committee, and business development, marketing and sales executives. This data were analysed through inferential statistical analysis technique with the support from Statistical Package for Social Sciences (SPSS) software and Microsoft Excel for descriptive and inferential statistical analysis and visualisation, for example, stacked graphs. Statistical Package for Social Sciences was mainly used to generate the data results in Microsoft Excel.

For ethical consideration, permission to conduct this research and use University of Johannesburg (UJ) as the research site was obtained from the UJ College of Business and Economics Research Ethics Committee (CBEREC) in accordance with the UJ Code of Academic Research Ethics (2007).

Results and findings

This research article aimed to determine whether graduates who entered the business environment demonstrated the ability to produce effective business innovation through knowledge and critical skills. Figure 2 illustrates the results on whether graduates entering the business environment in the past 3 years demonstrated the ability to produce effective business innovation. The four options given to participants were: never, seldom, often and always, and 13 statements shown on the category axis are:

- Analytical thinking.
- Innovation disposition.
- Active learning and learning strategies.
- Creativity, originality and initiative.
- Technology design and programming.
- Critical thinking.
- Leadership.
- Social influence.
- Complex problem solving.
- Emotional intelligence.
- Reasoning for problem solving.
- Ideation.
- Systems analysis and evaluation.

The results on each of these components are illustrated in Figure 2.

Figure 2 reports the findings, of which it is important to note the phrase, 'the ability to demonstrate', as it relates to the signification framework *Produce* element. The results were as follows, illustrated in Figure 2 at statement 1 on the ability to demonstrate analytical thinking, none of the participants indicated never, 39.7% indicated seldom, 49.2% indicated often and 11.1% indicated always. Figure 2 at statement 2 on the ability to demonstrate innovation disposition, 1.6% of the participants indicated never, 45.3% indicated seldom, 42.2% indicated often and 10.9% indicated always.

Figure 2 at statement 3 on the ability to demonstrate active learning and learning strategies, none of the participants indicated never, 34.9% indicated seldom, 46.0% indicated often and 19.0% indicated always. Figure 2 at statement 4 on the ability to demonstrate creativity, originality and initiative, 1.5% of the participants indicated never, 34.8% indicated seldom, 47% indicated often and 16.7% indicated always.

Figure 2 at statement 5 on the ability to demonstrate technology design and programming, none of the participants indicated never, 43.1% indicated seldom, 49.2% indicated
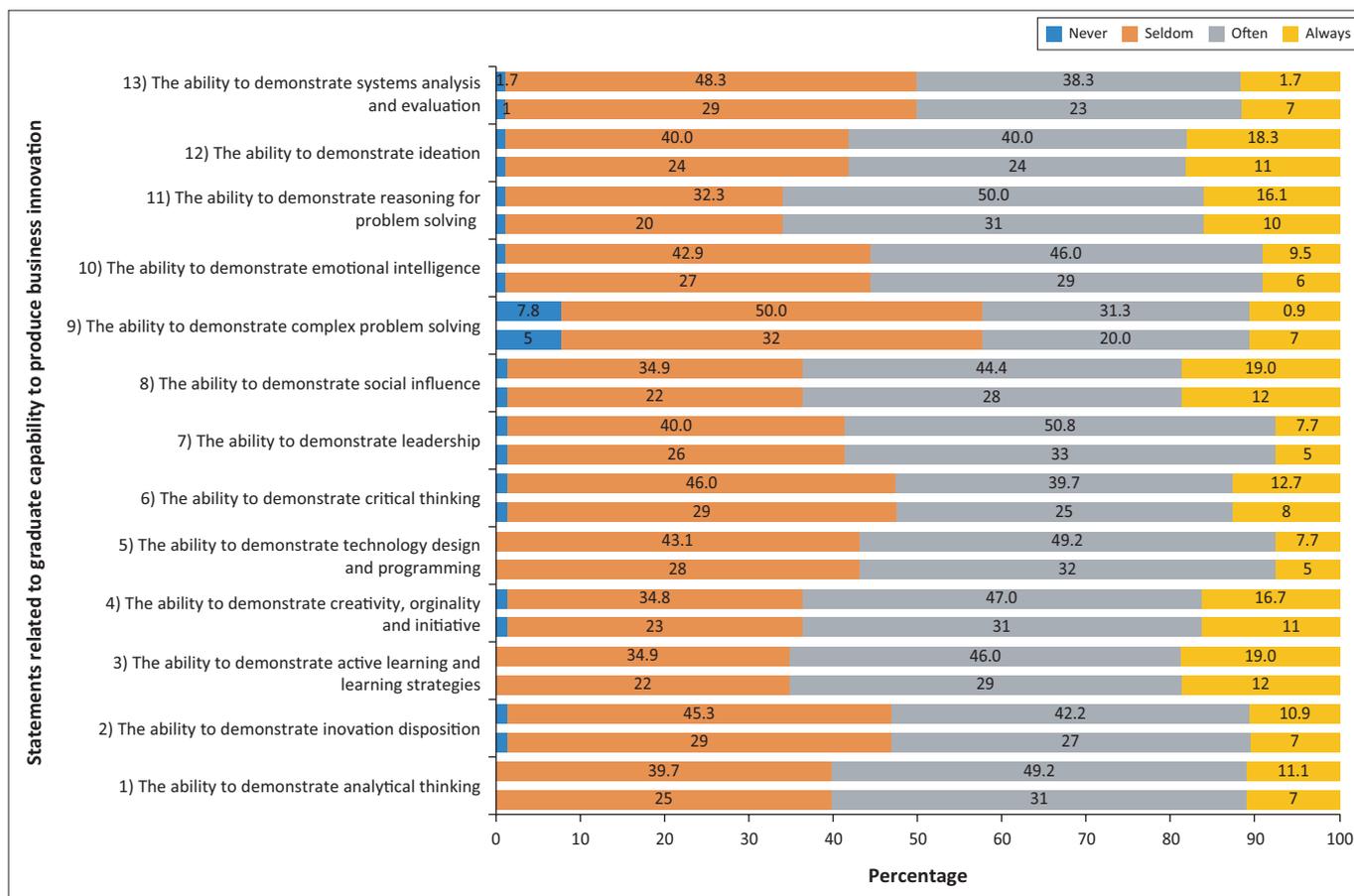
FIGURE 2: Graduates' capability to demonstrate and/or produce the following for effective business innovation.

often and 7.7% indicated always. Figure 2 at statement 6 on the ability to demonstrate critical thinking, 1.6% of the participants indicated never, 46% indicated seldom, 39.7% indicated often and 12.7% indicated always. Figure 2 at statement 7 on the ability to demonstrate leadership, 1.5% of the participants indicated never, 40% indicated seldom, 50.8% indicated often and 7.7% indicated always.

Figure 2 at statement 8 on the ability to demonstrate social influence, 1.6% of the participants indicated never, 34.9% indicated seldom, 44.4% indicated often and 19% indicated always. Figure 2 at statement 9, on the ability to demonstrate complex problem solving, 7.8% of the participants indicated never, 50% indicated seldom, 31.3% indicated often and 10.9% indicated always. This is a clear indication that problem-solving skill in the university curriculum requires attention.

Figure 2 at statement 10 on the ability to demonstrate emotional intelligence, 1.6% of the participants indicated never, 42.9% indicated seldom, 46% indicated often, 9.5% indicated always. Figure 2 at statement 11 on the ability to demonstrate reasoning for problem solving, 1.6% of the participants indicated never, 32.3% indicated seldom, 50% indicated often and 16.1% indicated always.

Figure 2 at statement 12 on the ability to demonstrate ideation, 1.7% of the participants indicated never, 40% indicated seldom, 40% indicated often and 18.3% indicated always. Figure 2 at

statement 13 on the ability to demonstrate systems analysis and evaluation, 1.7% of the participants indicated never, 48.3% indicated seldom, 38.3% indicated often and 11.7% indicated always.

Based on the results depicted in Figure 2, an equal distribution exists between seldom and often, which indicates tension with regard to whether graduates seldom demonstrated the ability to produce effective business innovation *or* whether they often demonstrated the ability to produce effective business innovation. For example, graduates' ability to demonstrate ideation has an equal distribution: 40% of the participants indicated seldom and 40% indicated often. It is decisive that 18.3% of the participants indicated that graduates always demonstrated the ability to produce effective business innovation. This is an indication that although universities are doing a fair job in preparing students, more focus should be placed on skills like ideation, analytical thinking, innovation disposition, technology design and programming, critical thinking, leadership, complex problem solving and systems analysis and evaluation. Based on these results, the researcher was able to develop the *Produce* element of this study's signification framework (Figure 3).

Intervention discussion

Figure 3 presents the *Produce* intervention key for identifying whether an intervention is required in terms of graduates'
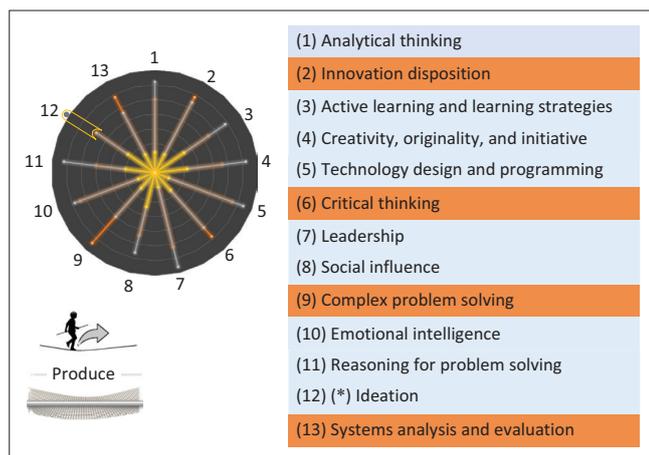
* in the significance framework indicates a major gap.

FIGURE 3: Produce intervention key – Graduates' capabilities.

capabilities that will lead to effective business innovation. Figure 3 shows the four highlighted critical skills and knowledge that the university needs to place emphasise in when re-evaluating its curriculum. The results from the research participants indicate that graduates seldom demonstrate the ability to innovate, think critically, solve complex problems and analytical skills. Hence, Figure 3 reflects the intervention that the university needs to focus regarding its curriculum to ensure that it produces graduates with the knowledge and capability to produce business innovation, through innovation disposition, critical thinking, problem solving, and systems analysis and evaluation.

Application 1: Based on Figure 3 intervention key, if graduates entering the business environment seldom demonstrate an innovation disposition, critical thinking, complex problem solving, and systems analysis and evaluation, yet effective business innovation requires of graduates these capabilities, then HEIs need to re-evaluate teaching and learning on innovation disposition, critical thinking, complex problem solving, and systems analysis and evaluation so that students are equipped with the required capabilities to produce business innovation and solve problems.

Application 2: If graduates entering the business environment do not excel at ideation, they will not produce effective business innovation; therefore, HEI curriculum alignment needs adjustment through intervention to produce graduates with relevant capabilities. This can be achieved through re-evaluating the curriculum regarding innovative characteristics, problem-solving skills, critical thinking and analytical skills.

Conclusion

The quest to create innovative and entrepreneurial institutions with the capability of producing graduates with the skills and knowledge suitable to contribute to the business environment through effective business innovation presented a research gap for this research article. This article aimed at determining whether university graduates who entered the business environment demonstrated the knowledge and capability to produce effective business innovation. The gap was addressed through a signification framework that produced an intervention key relevant to the graduates' capability to demonstrate or produce the following for effective business innovation. This intervention key guides the HEI through intervention benchmarks. Based on the findings, although universities are doing a fair job in preparing graduates for the world of work, there is significant room for improvement in preparing graduates to be ready for the industry.

In conclusion, based on the results and the intervention key, it is recommended that HEIs should train graduates and place focus on transferring knowledge and skills such as innovation disposition, critical thinking, complex problem solving, and systems analysis and evaluation to ensure that university graduates produced have the capability to demonstrate and produce effective business innovation and thus contributing to the growth of the South African economy.

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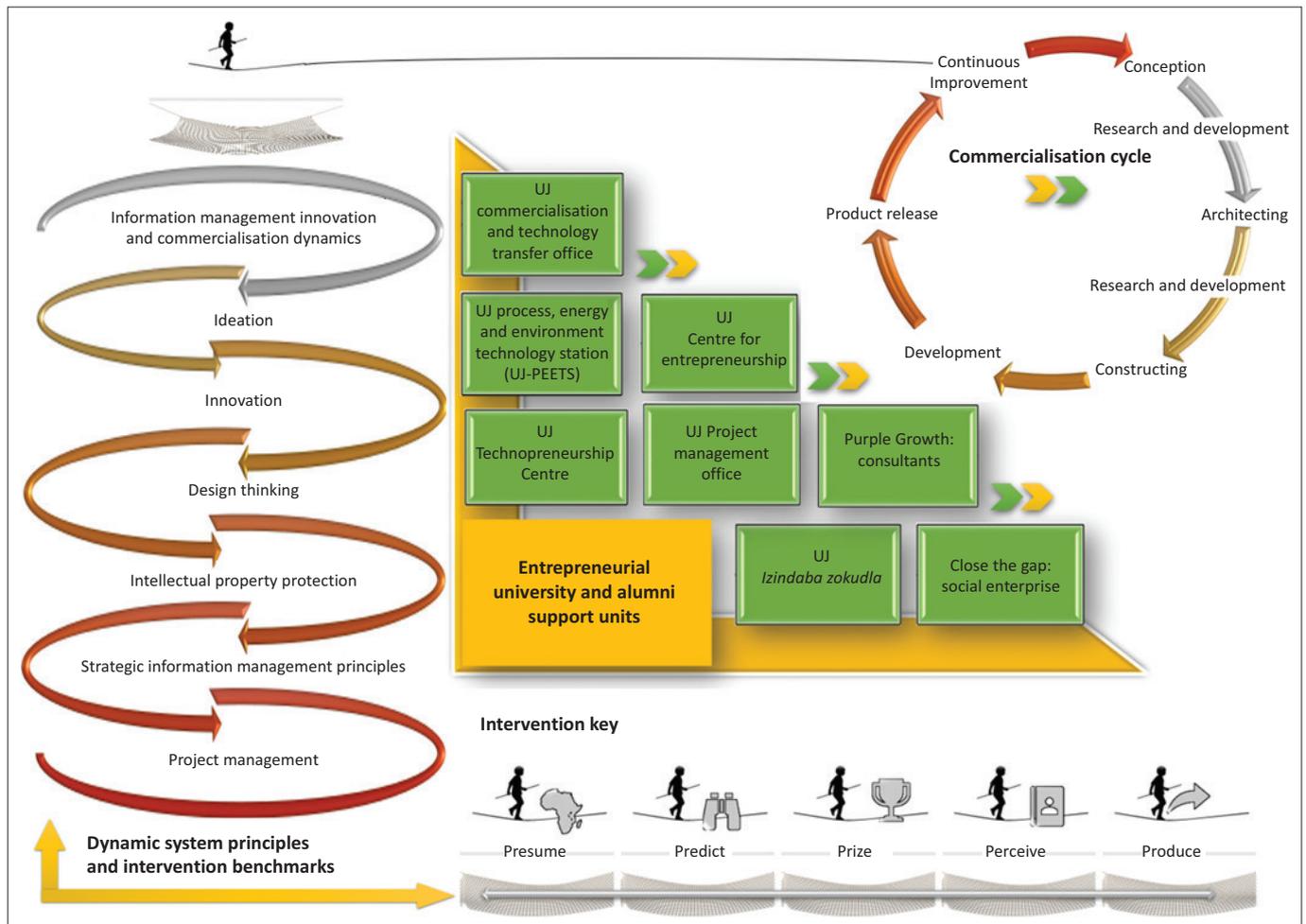
Appendix 1

Signification framework for the Strategic Information Management system for commercialisation dynamics of entrepreneurial universities.

UJ, university of Johannesburg.

FIGURE 1-A1: Signification framework.

Appendix 2

Online survey questionnaire.

Business Innovation Experts Questionnaire

Study purpose: To develop a strategic information management system for commercialisation dynamics of entrepreneurial universities

Institution: University of Johannesburg

Letter of Consent, Terminology and Abbreviations:

Study: Strategic Information Management system for commercialisation dynamics of entrepreneurial universities

Degree: PhD (Information Management)

Objective: Obtain consent from research participants in writing and set out the conditions of participation

Letter of informed consent

I, the Research Participant, hereby indicate that I have read and understand the conditions set out below for participation in the above-mentioned research. I hereby give written permission to Mr Sithembiso Khumalo that he may conduct this questionnaire for data collection, given the following conditions of participation:

- Participants will at all times be fully informed about the research purpose and process.
- Participants will have the option to participate by providing answers to questions in an online questionnaire format, answering and submitting their response to the researcher. Therefore, professionalism etiquette will govern the data collection process, through communication, formally requesting respondents to participate in the online questionnaire.
- The responses will be captured electronically once submitted and analysed using a secure survey tool; the researcher undertakes to store data in a secure environment.
- Participation is voluntary and opportunity to comment on the findings from the questionnaire will be afforded to participants as well as the right to withdraw from the study at any time, without any pressure to provide reasons.
- Participants will not be exposed to any acts of deception or betrayal in the research process or its published outcomes; faithfulness, keeping of agreements and loyalty in interpersonal relationships are central to the reputation of the researcher, the research supervisor and the educational institution.

Terminology and abbreviations:

- **SIM:** Strategic Information Management refers to the process of planning, identifying resources and the discovery of methods to achieve organisational goals and objectives. The focus is to strategically collect, manage and transfer knowledge in order to get the best return on enterprise resources by getting things done efficiently.
- **Commercialisation:** Commercialisation can be described as the process or the cycle of introducing a new product or production method into the market.
- **Presume:** To suppose that (a specific thing) is the case on the basis of probability or likelihood.
- **Predict:** To say or estimate that (a specific thing) will happen in the future or will be a consequence of (a specific thing).
- **Prize:** To value (a specific thing) as extremely highly valuable.
- **Perceive:** To interpret or regard (a specific thing) in a particular way.
- **Produce:** To lead to or cause (a specific thing) to happen or exist.

Section A

1. Please indicate the gender you identify with:
a) Female
b) Male
c) Non-discriminatory

2. What is your age in years?
a) 18 to 24
b) 25 to 34
c) 35 to 44
d) 45 to 54
e) 55 to 64
f) 65 to 74
g) 75 or older

3. How long have you been working in the field of business innovation?
a) Less than 3 months
b) 3 to 6 months
c) 6 to 12 months
d) 1 to 2 years
e) 2 to 4 years
f) 4 to 6 years
g) 6 to 10 years
h) 10+ years

4. Which category best describes your current role? (select one).
a) Company representative
b) Government representative
c) Chief Executive Officer
d) Managing Director
e) Entrepreneur
f) Investor

g) Exhibitor

h) Academic

i) Attorney

j) Founder

k) If other, please specify

5. What other roles do you currently play? (select all applicable).

a) Company representative

b) Government representative

c) Entrepreneur

d) Investor

e) Exhibitor

f) Chief Executive Officer

g) Managing Director

h) Academic

i) Attorney

j) Founder

k) If other, please specify

6. On what level do you mostly engage with Graduates? (select one).

a) I am currently in a graduate program.

b) I sometimes mentor graduates.

c) I work on projects where graduates are also involved.

d) I appoint graduates in the company.

7. On what other levels do you also engage with Graduates? (select all applicable).

a) I am a recruiter.

b) I am an alumni of my university.

c) I am currently in a graduate program.

d) I am a mentor of graduates.

e) I work on project where graduates are also involved.

f) I appoint graduates in the company.

g) I counsel graduates.

Section B

1. To what extent would you PRESUME the following statements to be true with regards to innovation?	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Innovation is a patentable business solution.	1	2	3	4
b) Innovation is a new product or process.	1	2	3	4
c) Innovation refers to newly added components that shift the value to new business opportunities.	1	2	3	4
d) Innovation is invention turned into solutions valued above every existing alternative.	1	2	3	4
e) Innovation is ideas that pass through the business model and meet with acceptance by users.	1	2	3	4
f) Innovation is the successful commercialisation or adoption of radical invention.	1	2	3	4
g) Innovation can be a thin line connecting the intuitive, the rational and the market.	1	2	3	4
h) Innovation means that a new approach is applied to an old problem.	1	2	3	4
i) Innovation is the creation of solutions to problems that have opposing requirements.	1	2	3	4
j) Innovation aims at finding and profitably serving unmet market needs.	1	2	3	4
k) Innovation is an intervention that shows evidence of a valued solution.	1	2	3	4

2. To what extent do you PREDICT the following to occur due to the development of a business innovation?	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Improve sales and customer relationships.	1	2	3	4
b) Reduce waste and costs.	1	2	3	4
c) Boost your market position.	1	2	3	4
d) Reduce workplace turnover.	1	2	3	4
e) Improve productivity.	1	2	3	4
f) Increase competitiveness.	1	2	3	4
g) Improve brand recognition and value.	1	2	3	4
h) Increase turnover and improve profitability.	1	2	3	4

3. In your experience, how often do you PERCEIVE the following to be true with regard to the characteristics of an innovative person?

	Please select only one option per statement			
	1: Never	2: Seldom	3: Often	4: Always
a) An innovation person has high risk tolerance.	1	2	3	4
b) Innovative people communicate effectively with their team to convey a unified vision.	1	2	3	4
c) Innovative people display openness to new ideas, even radical ones.	1	2	3	4
d) Innovative leaders are low on anxiety.	1	2	3	4
e) Inventors are grounded and have their emotions under control.	1	2	3	4
f) Innovative people are comfortable with change.	1	2	3	4
g) Innovators feel energised by the action and the buzz of creativity.	1	2	3	4
h) Innovative people are collaborative.	1	2	3	4
i) Innovative people encourage open dialogue.	1	2	3	4
j) Innovators pay attention by means of being keen observers.	1	2	3	4

4. To what extent do you PRIZE the following innovation features of a business environment?

	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Business leadership	1	2	3	4
b) Explorative culture	1	2	3	4
c) Financial literate employees	1	2	3	4
d) Structured systems	1	2	3	4
e) Technical skill development	1	2	3	4
f) Non-technical skill development	1	2	3	4
g) Business sales and profitability	1	2	3	4
h) Compensation	1	2	3	4
i) Brand identity	1	2	3	4
j) Community service	1	2	3	4

5. To what extent do you PRIZE the following skills for a person with a Bachelor of Commerce degree obtained from a South African University?

	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Complex problem solving	1	2	3	4
b) Critical thinking	1	2	3	4
c) Creativity	1	2	3	4
d) People management	1	2	3	4
e) Coordinating with others	1	2	3	4
f) Emotional intelligence	1	2	3	4
g) Judgement and decision making	1	2	3	4
h) Service orientation	1	2	3	4
i) Negotiation	1	2	3	4
j) Cognitive flexibility	1	2	3	4
k) Design thinking	1	2	3	4

6. Considering the skill status of Graduates entering the workplace in the past 3 years, how often do you encounter Graduates with the capability to demonstrate the following for effective business innovation?

	Please select only one option per statement				
	1: Never	2: Seldom	3: Often	4: Always	5: Don't know
a) The ability to demonstrate analytical thinking.	1	2	3	4	5
b) The ability to demonstrate innovation disposition.	1	2	3	4	5
c) The ability to demonstrate active learning and learning strategies.	1	2	3	4	5
d) The ability to demonstrate creativity, originality and initiative.	1	2	3	4	5
e) The ability to demonstrate technology design and programming.	1	2	3	4	5
f) The ability to demonstrate critical thinking.	1	2	3	4	5
g) The ability to demonstrate leadership.	1	2	3	4	5
h) The ability to demonstrate social influence.	1	2	3	4	5
i) The ability to demonstrate complex problem solving.	1	2	3	4	5
j) The ability to demonstrate emotional intelligence.	1	2	3	4	5
k) The ability to demonstrate reasoning for problem solving.	1	2	3	4	5
l) The ability to demonstrate ideation.	1	2	3	4	5
m) The ability to demonstrate systems analysis and evaluation.	1	2	3	4	5

7. To what extent do you PRIZE these components as important for the commercialisation of innovation?

	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Product conceptualisation	1	2	3	4
b) Product architecting	1	2	3	4
c) Product construction	1	2	3	4
d) Product development	1	2	3	4
e) Product release	1	2	3	4
f) Ideation stage	1	2	3	4
g) Business process stage	1	2	3	4
h) Engage stage	1	2	3	4
i) Marketing	1	2	3	4
j) Research and development	1	2	3	4
k) Funding	1	2	3	4
l) Legal advice and contracts	1	2	3	4
m) Due diligence	1	2	3	4

8. To what extent do you PREDICT that an individual's ability to be innovative will improve as a consequence of having the following skills and competencies?

	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Analytical thinking	1	2	3	4
b) Innovative disposition	1	2	3	4
c) Active learning and learning strategies	1	2	3	4
d) Creativity, originality and initiative	1	2	3	4
e) Technology design and programming	1	2	3	4
f) Critical thinking	1	2	3	4
g) Leadership	1	2	3	4
h) Social influence	1	2	3	4
i) Complex problem solving	1	2	3	4
j) Emotional intelligence	1	2	3	4
k) Reasoning, problem solving	1	2	3	4
l) Ideation	1	2	3	4
m) Systems analysis and evaluation	1	2	3	4

9. In your opinion, how relevant are the following aspects of the Higher Education curriculum in aid of the development of innovative Graduates?

	Please select only one option per statement			
	1: Totally irrelevant	2: Somewhat irrelevant	3: Somewhat relevant	4: Totally relevant
a) Ideation development	1	2	3	4
b) Collaboration	1	2	3	4
c) Value creation	1	2	3	4
d) Information and communication technology	1	2	3	4
e) Organisational culture	1	2	3	4
f) Product development	1	2	3	4
g) Design thinking	1	2	3	4
h) Strategic information management	1	2	3	4
i) Emotional intelligence	1	2	3	4

10. To what extent would you like the following aspects to be considered relevant in the Higher Education curriculum in order to ensure the readiness of Graduates to develop business innovation?

	Please select only one option per statement			
	1: To no extent	2: To some extent	3: To a moderate extent	4: To a great extent
a) Strategic information management	1	2	3	4
b) Artificial intelligence	1	2	3	4
c) Entrepreneurship	1	2	3	4
d) Advanced business management	1	2	3	4
e) Systems analysis and evaluation	1	2	3	4
f) Big data and analytics	1	2	3	4
g) Analytical thinking and innovation	1	2	3	4
h) Creativity, originality and initiative	1	2	3	4
i) Technology design and programming	1	2	3	4
j) Critical thinking and analysis	1	2	3	4
k) Leadership and social influence	1	2	3	4
l) Complex problem solving	1	2	3	4
m) Emotional intelligence	1	2	3	4