

Student Entrepreneurship Support at South African Public Universities: An Ecosystem Perspective

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Abstract

Purpose: It is widely agreed that student entrepreneurship can play a vital role in changing the economic landscape of developing countries. However, the effectiveness of university-based student entrepreneurship support (SES) has been questioned. Our study aimed to gain greater insights into SES in a developing country context by taking an ecosystem perspective on SES offered at South African public universities.

Methodology: A multiple case study strategy was adopted, and data was collected through online semi-structured interviews. Fourteen key informants, holding various positions at eight South African universities, were carefully selected to participate in the study.

Findings: Several types of SES are commonly aimed at developing entrepreneurs, promoting entrepreneurship as a career, and establishing job-creating businesses. To increase the effectiveness of this support, creative spaces, business advice from experts, top management buy-in and funding were regarded as very essential to enhance the interaction and collaboration between different elements in the ecosystem.

Practical implications: As creating a conducive environment for student entrepreneurs cannot occur in isolation, universities' top management buy-in



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and financial backing are recommended to establish and offer a broad range of support internally and through external collaborations.

Originality/value: This study contributes to the limited research on SES and responds to several calls to research elements within university-based entrepreneurial ecosystems in a developing country context.

Keywords: student entrepreneurship support; ecosystems; university-based entrepreneurial ecosystems

Introduction

It is widely agreed that student entrepreneurship can play a vital role in changing the economic landscape of developing countries (Hamilton and Mostert 2019) through empowering the youth socially and economically (Ndedi 2014), reducing poverty (Malebana 2017), developing new technologies and increasing innovation capabilities (Atiase et al. 2018). However, the effectiveness of university-based student entrepreneurship support (SES) has come under scrutiny (Morris, Shirokova, and Tsukanova 2017), underscoring the necessity for diverse support mechanisms to cultivate enabling environments for student entrepreneurs (Entrepreneurship Development in Higher Education Baseline Study 2019).

Despite the vital role of student entrepreneurship and the need for universities to support students, Breznitz and Zhang (2019) contend that SES specifically has been subjected to little research among scholars. They add that most research on entrepreneurship in a university setting focuses almost exclusively on licensing patents and creating spin-offs from staff. Yusoff et al. (2017) assert a lack of research regarding the students' perception of support and the support structures needed to create a conducive environment. Several authors (Lahikainen et al. 2019; De Araujo Ruiz, Martens, and Da Costa 2020) also contend that the broad spectrum of student entrepreneurship supporting elements – including government funding, incubators, and co-curricular activities – within a university-based entrepreneurial ecosystem (U-BEE) in a developing country context, require further investigation. Also, Bergmann, Hundt, and Sternberg (2016, 71) highlight the need to approach university-based student entrepreneurship within the context of entrepreneurial ecosystems and conclude that “a coordinated strategy ... may be more successful than isolated efforts”. Indeed, taking the ecosystem metaphor seriously requires investigating the interaction between entrepreneurial ecosystem elements (Kuckertz 2019). Heeding this call for more research on how the various elements of U-BEEs interact, the purpose of our study was to gain greater insights into SES in a developing country context through taking an ecosystem perspective on SES offered at South African public universities. We aimed to firstly, describe the SES at selected South African public universities and secondly, explore how the student entrepreneurship supporting elements of U-BEEs interact to make an impact.

Literature Overview

Effectiveness of SES

In keeping with an entrepreneurial ecosystem perspective, student entrepreneurs are at the heart of successful ecosystems (Stam 2015), and the SES offered is specifically attuned to the development of this group of actors. Many SES initiatives tend to be experiential in nature and allow students to gain practical experience and autonomous learning capabilities leading to an expanded knowledge base, increased self-confidence, and a greater chance of subsequent actions (Morris, Shirokova, and Tsukanova 2017; Preedy 2018). As part of self-identity, Roos and Botha (2022) argue that increased self-confidence (self-efficacy) is important for bridging the entrepreneurial intention-action gap. It is also well supported in the literature that, like entrepreneurship education (Nade and Malamsha 2021), the availability of SES at a university increases students' entrepreneurial intentions, their start-up activities, and the chances of successfully starting a business (Choi et al. 2017; Morris, Shirokova, and Tsukanova 2017; Nguyen et al. 2021).

Most studies investigating SES within U-BEEs have been undertaken in developed countries (Lahikainen et al. 2019; De Araujo Ruiz, Martens, and Da Costa 2020), as we illustrate in Table 1. However, there is now a burgeoning literature on SES in economically less-developed regions across the globe. For example, researchers have studied the role of educational institutions in developing entrepreneurship among students in South Africa (Nicolaidis 2011), the challenges that student entrepreneurs face (Shambare 2013; van der Spuy and Bornman 2023), the outcomes of entrepreneurial education initiatives (Tshikovhi and Mvula 2014) and supportive infrastructure such as incubators (Cele and Williamson 2022; Shalaby 2020). Yet, remaining unanswered is how these elements can better interact within a U-BEE to ensure that SES is able to deliver on its promises in a developing country context such as South Africa.

TABLE 1: SES within U-BEEs

SES	Descriptions	Source
Entrepreneurship societies	Informal, non-accredited student-led societies focused on promoting entrepreneurship as a viable career option and developing the entrepreneurial skills of students.	Morris, Shirokova, and Tsukanova (2017); Nguyen et al. (2021); Schimperna, Nappo, and Marsigalia (2022)
Technology transfer office	A central agent tasked with managing the university's intellectual property, identifying, and encouraging the disclosure of inventions with the potential to be commercialised, and facilitating the transfer of technology from a research institution to market.	Good et al. (2018); Cunningham, Lehmann, and Menter (2022)

Entrepreneurship competitions	Competitions that provide a stimulus for entrepreneurial activities (e.g., business plan and pitching competitions) where students stand a chance to win seed money and/or gain valuable entrepreneurial knowledge and skills.	Morris, Shirokova, and Tsukanova (2017); Preedy (2018); Nguyen et al. (2021); Schimperna, Nappo, and Marsigalia (2022)
Incubators / Incubation programmes	A programme offered with the sole purpose of providing support to early-stage entrepreneurs.	Good et al. (2018); Nguyen et al. (2021); Cunningham, Lehmann, and Menter (2022)
Entrepreneurship strategic plan	A strategic objective that focuses on developing a conducive entrepreneurial environment and providing an entrepreneurial culture within the university.	Budyldina (2018)
Entrepreneurship workshops	Workshops that provide opportunities to network with entrepreneurs, receive mentorship, develop entrepreneurial skills, and gain practical entrepreneurial experience.	Viviers, Solomon, and Venter (2013); Nguyen et al. (2021); Schimperna, Nappo, and Marsigalia (2022)
Centre for entrepreneurship	Acts as the link between the various elements of the entrepreneurial ecosystem, increasing the accessibility of facilities provided to early-stage entrepreneurs or existing entrepreneurs with businesses.	Cunningham, Lehmann, and Menter (2022)
Practical entrepreneurship programmes	Programmes provided to students to emphasise practice over theory, allowing student entrepreneurs to develop their entrepreneurial competence in a practical yet risk-free environment.	Nguyen et al. (2021); Schimperna, Nappo, and Marsigalia (2022)
Entrepreneurship funding	Seed-type funding in the form of either equity or non-equity investments, loans, or small grants provided by the university to early-stage ventures run by students.	Morris, Shirokova, and Tsukanova (2017); Wright, Siegel, and Mustar (2017); Schimperna, Nappo, and Marsigalia (2022)
Science parks	Business support and technology transfer property-based organisation or initiative with links to an Institution of Higher Education focused on encouraging and supporting innovative and high growth start-up businesses.	Good et al. (2018); Cunningham, Lehmann, and Menter (2022)

Source: Authors' construction

The Design of University-Based Entrepreneurial Ecosystems

To gain insight into the effective organisation of SES within a U-BEE, it is important to understand the organisational structure of universities: “An organisational design

must specify the fit between the structure of division of tasks in the organisation with its coordination, or how to make these tasks work in concert” (Burton and Obel 2018, 1). Because the principles of organisational design provide us with a framework to gain deeper insights into SES within U-BEES at South African public universities, these principles can also be useful in formulating recommendations for the most appropriate design to enhance universities’ effectiveness and efficiency (Burton and Obel 2018).

Although authors label the principles of organisational design differently (Ireland, Covin, and Kuratko 2009; Burton and Obel 2018), Good et al. (2018) assert that considerable overlap exists and that the various principles proposed consistently deal with organisational purpose, activities, structure, people and organisational culture (Table 2). For this reason, we adopt Good et al.’s (2018) principles of purpose, activities and people to provide greater insights into the organisation of SES within U-BEES at South African public universities. Good et al. (2018) label the fourth element “people and organisational culture”. However, in this study, only the “people” aspect is considered because “organisational culture” underlies the entire U-BEE and falls outside the ambit of our study. For the same reason, we do not consider the “structure” element of organisational design.

TABLE 2: Organisational design principles

Organisational purpose	The main reason for an organisation’s existence and what it would like to achieve
Activities	All the tasks performed by the employees to fulfil the purpose of the organisation and the different products and services being offered
Structure	The ownership and governance structure of the organisation, the size of the organisation, and its physical location
People and organisational culture	The key individuals employed by the organisation, the reward systems in place, and the internal organisational culture

Source: Good et al. (2018)

Although the SES offered by different universities are similar, their purpose, the nature of activities offered, and the people involved vary depending on several factors (Fichter and Tiemann 2018). These factors include a university’s entrepreneurial objectives (Hofer and Potter 2010), access to funding, the number of staff members available and their willingness to provide support, as well as the effectiveness of activity coordination (Preedy and Jones 2015). In addition, universities in the rural areas of developing countries such as South Africa (generally historically disadvantaged universities) tend to have fewer resources to support their staff and students (Malebana 2017). According to Malebana and Swanepoel (2015), the levels of entrepreneurial activity at universities in rural areas are lower than those in urban areas and this is due to poor infrastructure, fewer viable opportunities, smaller markets, and low levels of skill in these areas. Furthermore, in the context of South African public universities, historically advantaged universities – generally based in urban areas – still enjoy the benefits of higher national

and international rankings, resulting in more resources and funding than historically disadvantaged universities (Swartz et al. 2019). The lack of resources and fewer opportunities are attributed to factors such as rural disinvestment, proximity to natural resources, density, and diffusion of innovation (Addae-Korankye 2019). Because of geographical disparities, advantaged areas tend to grow more than disadvantaged areas, even during periods of general economic growth, as they experience a multiplier effect (Addae-Korankye 2019). Disadvantaged areas are considered to experience high levels of poverty due to the inaccessibility of resources or infrastructure that could assist them in stimulating their communities (Aderamo and Aina 2011). Swartz et al. (2019) add that historically advantaged universities generally attract greater alumni donations and larger grants from outside the government, while historically disadvantaged institutions struggle to compete, given their historical status and lack of access to resources. Thus, the geographical or historical context of a university, like that of a community, influences its ability to offer student entrepreneurs the support they need to become successful entrepreneurs, inhibiting their ability to give back to the communities in which they live ultimately.

Research Design and Methodology

To explore how an ecosystem perspective can help to understand the effectiveness of SES, a qualitative multiple-case study research strategy was chosen. This method allowed for a broader understanding of the SES offered at the participating universities, identifying differences between them in terms of the support offered and identifying recommendations.

To select the sample of universities that would serve as cases, desk research was undertaken. The various SES within U-BEEs, as described in the literature (Table 1), together with each university's name, served as the key search terms. Websites of the 26 public universities in South Africa and publicly available online information were scrutinised using these key terms to identify the SES offered by each. During this process, several SES not described in Table 1 were also identified. These other SES identified from the desk research also exist at South African public universities, as described in Table 3. Two researchers were involved in the screening and coding process to increase the trustworthiness of the desk research and decrease bias (Quinlan et al. 2015).

TABLE 3: Additional SES within U-BEEs identified via desk research

SES	Descriptions
Student entrepreneurship intervarsity	A competition to identify the top student entrepreneurs at South African public universities, recognise and showcase their businesses, and invite investment into this cohort of student businesses
Student entrepreneurship week	A one-week campaign hosted by universities where the institution, together with businesses, industry, and non-profit organisations, promote entrepreneurship as a career option
International collaborations	Universities that have collaborated with other universities across the globe to promote, enhance, and encourage entrepreneurship among students in South Africa
International presence	Students who have either competed in international competitions or have been invited to present their entrepreneurship ideas internationally
Entrepreneurship conferences	Conferences with a deliberate focus on entrepreneurship, student entrepreneurship, or university-based SES
Having an entrepreneurship policy	A policy aimed at promoting entrepreneurship among students and providing a supportive environment for student businesses to flourish
Entrepreneurship seminar	Seminars with a deliberate focus on entrepreneurship, student entrepreneurship, or university-based SES
Centre for social entrepreneurship	A centre aiming to promote social entrepreneurship among students by utilising innovative strategies to address socio-economic challenges and provide various programme offerings, partnerships and initiatives to encourage social entrepreneurship initiatives
Student training for entrepreneurial promotion	Training for youths and young adults focused on developing the skills, knowledge, and confidence of young individuals to pursue an entrepreneurial career

Source: Authors' construction

In line with a multiple-case study design and to facilitate the observation of contrasting data, we aimed to identify polar cases in the pool of 26 universities (Eisenhardt and Graebner 2007). The choice of polar cases was dictated by the need to introduce enough variation in the universities and the effectiveness of SES offered, akin to selecting cases with variation in the values of the dependent variable (Kaarbo and Beasley 1999). Taking cognisance of SES identified in the literature (Table 1) and from our desk research (Table 3), the number of these SES offered by each university was then calculated (all SES were given the same weight), which allowed for the universities to be ranked from most active (most SES) to least active (least SES) in terms of the number of SES listed in Table 1 and 3 that they are offering. Based on this ranking, the four most active (labelled Uni-A to D) and the four least active (labelled Uni-W to Z) universities were selected as cases for this study. Based on information obtained via the

desk research, the context of the eight participating universities and the number of SES offered by them is summarised in Table 4.

TABLE 4: Participating university's characteristics

	Most active				Least active			
	Uni-A	Uni-B	Uni-C	Uni-D	Uni-W	Uni-X	Uni-Y	Uni-Z
Age	Average age of 107.25 years				Average age of 47.25 years			
Historical context*	PD	NPD	NPD	NPD	PD	PD	NPD	PD
University type**	Trad	Tech	Trad	Trad	Trad	Comp	Trad	Comp
Faculties	Ranged from six to ten faculties				Ranged from three to six faculties			
Location	Rural	Urban	Urban	Urban	Rural	Rural	Urban	Rural
Number of staff***	Average number of staff 3 443				Average number of staff 737			
Number of students	Average number of students 29 203				Average number of students 15 186			
Average staff/student ratio	1:8.48				1:20.6			
Total SES (19)	14	14	13	12	4	4	3	2

*NPD = Not previously disadvantaged; PD = Previously disadvantaged

**Trad = Traditional university (offers theoretically orientated degrees); Tech = Technological university (offers vocationally orientated diplomas and degrees); Comp = Comprehensive university (offers a combination of both types of qualifications)

***Excluding Uni-B and Uni-W

Source: Authors' construction

Having identified the research cases, the study proceeded to extrapolate the purpose, activities and people associated with SES offered at these universities. To this end, semi-structured online interviews were conducted. An interview protocol was developed, and as advocated by Yin (2018), open-ended, Likert-type, and closed-ended questions were posed. The data was collected from 14 key informants holding various positions (Table 5). Interviews ranged from 1 hour 10 minutes to 1 hour 52 minutes.

After reading transcriptions of the interviews several times and making notes for ease of reference, a thematic analysis was performed on the data: NVIVO codes were used to reduce the data into smaller groups with similar meanings, or first-order level codes,

followed by second-order level codes (categories) and then themes (Maguire and Delahunt 2017). The results of this data analysis procedure are presented in the next section.

TABLE 5: Positions of informants

Informant	Position	Informant	Position
Uni-A-TM	Executive Director of Finance and Services	Uni-A-SEC/P	Student entrepreneurship coordinator/coach
Uni-B-TM	Director of the entrepreneurship centre/incubator	Uni-B-SEC/P	Director of Technology Transfer and Innovation
Uni-C-TM	Deputy Vice-Chancellor: Research, Innovation and Postgraduate Studies	Uni-C-SEC/P	Student entrepreneurship coordinator
Uni-D-TM	Head of Operations: Career Services	Uni-D-SEC/P	Entrepreneurship Centre: Programme Manager
Uni-W-TM	-	Uni-W-SEC/P	Educator/Academic
Uni-X-TM	-	Uni-X-SEC/P	Educator/Academic
Uni-Y-TM	Dean of Students	Uni-Y-SEC/P	Educator/Academic
Uni-Z-TM	Director of Research and Innovation	Uni-Z-SEC/P	Educator/Academic

*TM = Top management

**SEC/P = Student entrepreneurship champion/promotor

Source: Authors' construction

To guarantee the trustworthiness of the study, the credibility, dependability, transferability, and confirmability (Quinlan et al. 2015) of the data and the data collection process were ensured. The necessary ethics approval was obtained from the authors' institution prior to the collection of the data. Before undertaking the interviews, written consent was obtained, and each informant was guaranteed their right to privacy, anonymity, and confidentiality, as well as to voluntary participation in the study. To increase transparency, each informant was provided with the purpose of the study, the interview schedule, the consent form, and the details of the ethics approval prior to the interview. To ensure confidentiality, the researcher did not report any private information and raw data was encrypted and stored away.

Findings

Purpose of SES

Three aggregate themes were inducted to describe the current purpose (aim) of SES offered at the participating universities. The most prominent of these was *to develop entrepreneurs* (Theme 1). Such a purpose implies a focus on assisting students to become entrepreneurs, developing social entrepreneurs, and developing entrepreneurial skills. Informant Uni-D-TM noted that SES aims *“to ensure that our students go out and become entrepreneurs”*. However, informant Uni-X-SEC/P added that they aim to ensure that *“we have social entrepreneurs, so [that] we are also addressing social ills within our communities”*. When the focus is on developing entrepreneurial skills, activities aim to *“empower our students to be able to be entrepreneurial in the real world and to undertake entrepreneurial activities”* [Uni-A-TM]. It is also explained by informant Uni-Z-TM that *“we are no longer producing [people who] just hold degrees, but we are producing people who can create and identify opportunities”*.

The second theme inducted is to promote entrepreneurship as a viable career option. With such a purpose, the focus is to change [the] mindsets of students to *“see that instead of only being jobseekers, they can also prepare themselves to be job creators”* [Uni-W-SEC/P]. When the purpose is to promote entrepreneurship, the focus is on *“encouraging entrepreneurship to all students and enhancing the importance of entrepreneurship in all areas or every field”* [Uni-Y-TM].

The third theme inducted, namely, *to establish new businesses that create jobs*, describes the purpose as being the establishment of businesses, and the creation of employment opportunities. Informant Uni-C-SEC/P explained that *“we have developed world-class leaders, and now we want to develop businesses”*. Although *establishing businesses* underlies this theme, most of the key informants pointed out that these established businesses must contribute to creating jobs for others. Informant Uni-B-SEC/P explains that the businesses established must be *“able to create jobs, enhance economic growth, and decrease youth unemployment”*.

SES Offered at Universities

Key informants were presented with a list of possible SES within U-BEES (based on Tables 1 and 3) and requested to indicate which are currently organised at or being offered by their respective universities. The SES that were indicated by the majority of informants as currently taking place at or being offered by their respective universities are mentorship, counselling, provision of advice and coaching, training, workshops and seminars, networking events, material support (office and workspace, as well as meeting facilities), SES organisations, participation in the student entrepreneurship week, participation in the entrepreneurship intervarsity competition, and internal university business plan/pitching competitions. SES not indicated by most informants have an entrepreneurship centre, an incubator/accelerator (programme), a university-linked

science park/research park, or a university venture fund, the provision of material support (start-up capital and seed-funding), and a student entrepreneurship policy.

Moreover, the findings show that the more advanced and technical SES are not present at the least active universities. These include having an entrepreneurship centre, a technology transfer office, and an incubator/accelerator (programme). Other SES being offered (not listed) at the universities include a market day [Uni-A-SEC/P], an entrepreneurship fellowship programme [Uni-A-TM], the publication of success stories [Uni-Y-TM], and an innovation week [Uni-Z-TM].

Other SES Needed

The key informants also indicated the SES they thought student entrepreneurs at their respective universities needed most to increase their chances of establishing successful businesses. A creative space or entrepreneurship centre is considered most needed by six informants, three from the most active universities [Uni-A-TM, Uni-C-TM, Uni-D-TM] and three from the least active universities [Uni-X-SEC/P, Uni-W-SEC/P, Uni-Z-TM]. Key informants are of the opinion that such a space should be “*a creative space for students to come and just work there while they are busy with their idea*” [Uni-D-TM], or “*a play space around the concept of entrepreneurship and a space where a whole lot of things happen in terms of entrepreneurship*” [Uni-Z-TM]. However, Uni-A-TM explained, “... we are not going to offer space for students to conduct their business on-site because space is a big problem; everyone is fighting for space”.

Student entrepreneurs having access to funding was pointed out as needed by two informants from the most active universities [Uni-B-SEC/P, Uni-C-TM] and three from the least active universities [Uni-X-SEC/P, Uni-Y-SEC/P, Uni-Y-TM]. Uni-Y-SEC/P explained the following:

You might find a student who has a good idea, but without an ICT background or the required knowledge, it is a challenge. Without the finances to pay somebody to implement that idea, the idea falls apart. They end up giving it up.

Other support identified as needed most is business advisory and developmental support. This support is mostly concerned with business assistance and training for students. Of these, business plan development support [Uni-A-TM, Uni-Z-SEC/P] was highlighted. Informant Uni-A-TM explained, “*business plans let you consider x, y and z and whether you have done all that is required*”. Other advisory and development support identified as needed were in the areas of refining ideas [Uni-A-SEC/P], legal [Uni-A-TM], technical [Uni-Y-SEC/P] and business training [Uni-Z-SEC/P].

Enablers of SES

The key informants noted that to provide the most needed SES, the following are required: top management buy-in [Uni-A-SEC/P, Uni-A-TM, Uni-W-SEC/P, Uni-X-SEC/P, Uni-Z-SEC/P]; financial support [Uni-A-SEC/P, Uni-Y-TM, Uni-Y-SEC/P]; an

entrepreneurship policy [Uni-A-TM, Uni-W-SEC/P, Uni-Z-TM]; and external partnerships [Uni-Z-SEC/P].

Top management buy-in and financial support were the most frequently identified needs. As explained by Uni-A-TM, “we need the buy-in from our Vice-Chancellor and our other top management. We need it to become more of a university-wide mission”. Informant Uni-X-SEC/P further elaborated, saying, “once we have that someone [in top management], I feel we would be going somewhere because that person will be echoing what we think should be done”. Furthermore, Informant Uni-Y-TM emphasised: “I think the limited financial resources limit the extent to which we would want to support our students”.

In terms of the need for an entrepreneurship policy, Uni-Z-TM notes that for the effective and efficient provision of SES, “*the thinking must come through policy*”. However, informant Uni-A-TM cautions against implementing a student entrepreneurship policy, saying, “*we are not mature enough to deal with this policy because if there is a policy, it has a potential for being exploited*”.

External partnerships were also identified as enablers for SES, as explained by informant Uni-Z-SEC/P:

Partnerships with other actors are needed to provide the necessary training for writing business plans and funding for small businesses. They could help us set up these activities, and we could collaborate with them so that the university could provide various things like space, staff, and funding because the university always has this challenge of a lack of funding.

People Associated with SES

A specific person or team is currently tasked with organising SES at all the participating universities and includes a person or people with one or more of the following functions: academic(s) [Uni-W, Uni-X, Uni-Y, Uni-Z]; coordinator for student entrepreneurship [Uni-A, Uni-D]; centre for entrepreneurship staff [Uni-B]; and incubator staff [Uni-C]. At all four most active universities, specific individuals or a team are tasked with organising these types of SES. In contrast, at all four least active universities, academic staff members are tasked with organising these activities.

In sum, our findings highlight the importance of ecosystem thinking in ensuring the effectiveness of SES offered at South African public universities. Our findings suggest that a U-BEE has to be enacted for SES to be effective. Interactions between multiple SES within U-BEEs necessitate the collaboration of resourceful actors, both internal and external to the universities.

Discussion

Employing an ecosystem perspective to explore the effectiveness of SES offered at South African public universities provides a multifaceted perspective on how various elements within a U-BEE can interact to contribute to nurturing student entrepreneurship. An ecosystem perspective aligns with the theoretical frameworks proposed by Isenberg (2010) and Stam (2015) who argue that entrepreneurial ecosystems are complex, comprising various interdependent actors and factors influencing entrepreneurial outcomes.

The ecosystem perspective highlights the importance of interactions between elements in the U-BEE and external collaborators for effective SES to be offered. Similarly, Candeias and Sarkar (2024, 80) argue that siloed approaches within entrepreneurial ecosystems tend to be less effective: "... the core of the EE [entrepreneurial ecosystem] approach involves integrating a diverse array of actors, engaging in complex and multilayered interactions within the ecosystem". In our study of SES existing within entrepreneurial ecosystems at South African public universities, informants elaborated on the support they thought student entrepreneurs need the most at their universities. This included a creative space or entrepreneurship centre, access to funding, business advisory services, and developmental support, which are pivotal for cultivating thriving businesses (Maritz, Nguyen, and Ivanov 2022). According to Alves et al. (2019), universities generally are not providing a safe environment where student entrepreneurs can experiment with new ideas and follow their passions. Such a creative space is crucial as students often lack the necessary entrepreneurship support while attending university (Shambare 2013). The need for a creative space is specifically highlighted in our study.

The fact that student entrepreneurs need access to funding to ensure success is well supported in the literature and was also pointed out by several informants in our study. Numerous studies have found that accessing finance is the most significant challenge facing student entrepreneurs in South Africa (Viviers, Solomon, and Venter 2013; Iwu et al. 2016).

Furthermore, the need for business advisory services and development support could also be attributed to the traditional approach to teaching, which is generally adopted by South African universities (Shambare 2013). Our informants also underscore the necessity of top management buy-in, financial support, entrepreneurship policy, and external partnerships for the effectiveness of SES. As suggested by both Rice, Feters, and Greene (2014) and Suryanto (2019), when top management drives support for student entrepreneurship and makes it a priority, the resources needed to provide more effective and efficient support become available. According to Ndedi (2013), the absence of available funding to cover the high costs of establishing such support leads to a lack of efficiency. An entrepreneurship policy is crucial as it influences the nature and extent of the SES offered at universities (Rice, Feters, and Greene 2014). Furthermore, Elia, Secundo, and Passiante (2017) claim that forging strong collaborations between the university and external stakeholders, who offer specialised

support in entrepreneurship, is crucial for fostering an innovative and entrepreneurial ecosystem. Given the support identified as needed by students and the need for top management, financial, policy and partnership support, our findings illustrate that public universities in South Africa are not effectively providing SES despite multiple U-BEE elements supporting student entrepreneurship.

We suggest that university top management interact more with the other elements in the U-BEE by intensifying their commitment to SES through strategically developing and advocating for policies dedicated to nurturing SES (Graham 2014; Lahikainen et al. 2019). A well-defined strategic vision emphasising the pivotal role of SES in cultivating a dynamic entrepreneurial environment for students is essential. This vision should detail specific objectives and measures designed to bolster student entrepreneurship, thereby fostering an ecosystem where innovation thrives (Graham 2014). Critical to this effort is the endorsement and financial backing from top management. Without their support, sustainable bottom-up initiatives risk failing when undermined by insufficient funding and administrative backing (Fichter and Tiemann 2018). Leadership and governance are fundamental to embedding entrepreneurship within the university's strategic framework, ensuring that innovation and entrepreneurship are prioritised as key institutional goals (Graham 2014).

We also suggest that interactions with resourceful partners external to the university could play an important role in the provision of support such as funding as well as business advisory services and development. Collaborations with industry, government and non-profit organisations can enhance the scope and impact of SES, thereby enriching the entrepreneurial ecosystem within universities. Several authors (Graham 2014; Elia, Secundo, and Passiante 2017) advocate the benefits for universities to have strong relationships built on mutual trust and with several external stakeholders who support entrepreneurs. However, Miller and Acs (2017) argue that students usually prefer to access resources available to them within the university setting as this allows for more liberty and openness. These aspects of top management, financial, policy and partnership support are crucial for assisting student entrepreneurs in overcoming their challenges and creating a more conducive entrepreneurial environment.

Several differences between the participating universities in terms of their context were found in relation to the number of support activities offered by their institution. Context matters in ecosystem thinking, and drawing from the theory of geographical disparities (Addae-Korankye 2019), one could speculate that these differences are a result of geographical and historical context. The majority of the most active universities are not previously disadvantaged or are located in urban areas, whereas most of the least active universities are previously disadvantaged and located in rural areas. This finding aligns with Swartz et al. (2019) who report that previously disadvantaged institutions in South Africa are generally found in rural areas, which we suggest could influence their ability to provide SES effectively and efficiently. Thus, through the ecosystem perspective, an emphasis could be placed on the importance of customising SES within U-BEEs to align

with each context's unique challenges and opportunities. This tailored approach ensures that SES is not only relevant but also deeply integrated into the local entrepreneurial landscape, enhancing its effectiveness and impact (Belitski and Heron 2017).

In conclusion, adopting an ecosystem perspective provides valuable insights into the complex yet much-needed interactions between the U-BEE elements that influence the effectiveness of SES offered by universities. It emphasises the need for a holistic contextualised approach that considers the diverse needs of student entrepreneurs, the support structures available within the university, and the external environment. By focusing on the ecosystem's collective impact, universities can better design and implement SES that foster a vibrant entrepreneurial culture and contribute to socio-economic development.

Implications and Recommendations

Theoretical Implications

Building upon the seminal work of Isenberg (2010) and Stam (2015), a theoretical implication of our study is that it enhances the discussion on the intricate, interactive and collaborative characteristics of entrepreneurial ecosystems in university environments. Acknowledging that intricate dynamics within entrepreneurial ecosystems are crucial for nurturing entrepreneurship is amplified in our study, particularly in the context of higher education and student entrepreneurship support. Our study explores the nature of and interactions between several student entrepreneurship-supporting U-BEE elements, expanding the use of an ecosystem perspective to encompass the specific environment of higher education institutions and their support systems for student entrepreneurship.

Moreover, our results highlight the crucial role that universities have in fostering entrepreneurial aspirations and initiatives among students, aligning with and expanding upon the findings of Wright, Siegel, and Mustar (2017). Universities emerge not merely as bastions of knowledge and education but as pivotal agents in entrepreneurship facilitation through SES. Our study substantiates the argument that universities' active involvement in structuring SES within their ecosystems can noticeably influence the entrepreneurial trajectories of students. The role of higher education institutions is thus seen to transcend traditional boundaries, positioning them as central hubs in entrepreneurship and innovation systems.

By focussing on the context of South African public universities, our research contributes distinctive insights into the geographical and contextual variances inherent in entrepreneurial ecosystems. The least active universities in our study had a somewhat less developed entrepreneurial ecosystem than those of the most active universities. Aligning with discussions by Addae-Korankye (2019) and Autio et al. (2014), this could be attributed to their contextual difference (rural vs urban; previously advantaged vs disadvantaged). Our focus on South African public universities raises the important

question of how historical and geographical backdrops tailor the configuration and impact of SES, inviting a more contextualised comprehension of entrepreneurship support mechanisms in developing contexts. Leveraging Isenberg's (2010) framework for evaluating and cultivating entrepreneurial ecosystems in non-traditional settings, this study also illustrates the necessity for customised strategies in fostering student entrepreneurship, particularly within the nuanced and diverse South African context. This nuanced exploration not only amplifies our understanding of the entrepreneurial ecosystem within universities but also highlights the imperative for adaptive and context-sensitive approaches in entrepreneurship education and support across different global regions.

Practical Implications

As Stam (2015, 1759) notes, "the entrepreneurial ecosystem approach speaks directly to practitioners". Indeed, from an ecosystem perspective, the exploration of SES within South African public universities presents significant practical implications for universities, policymakers, and all stakeholders aiming to cultivate student entrepreneurship within higher education settings. This analysis underscores the imperative of adopting a holistic and synergistic approach to SES, pointing out that the effectiveness of such initiatives relies profoundly on the interaction and cohesion among various elements of the U-BEE.

At the forefront, universities are identified as crucial enablers in fostering an environment conducive to student entrepreneurship. The diversity of SES, encompassing mentorship, incubation, financial support, and networking opportunities underscores the comprehensive nature of support essential for nurturing aspiring entrepreneurs. It is recommended that universities thoroughly evaluate their SES offerings, ensuring they are well-rounded and cater to both the tangible and intangible facets of student entrepreneurship needs. Echoing Good et al. (2018) and aligning with Bergmann, Hundt, and Sternberg (2016), this study advocates for a strategically coordinated and interactive approach, integrating organisational purpose, activities, structure, and personnel to bolster student entrepreneurship support effectively.

Furthermore, the criticality of securing top management endorsement and financial backing as catalysts for SES cannot be overstated. This calls for a strategic commitment from the upper echelons of university governance, manifesting through dedicated resource allocation, both financial and human, to support SES endeavours. Preedy (2018) and Morris, Shirokova, and Tsukanova (2017) emphasise the value of experiential learning platforms, such as entrepreneurship competitions and workshops, in honing entrepreneurial skills. Consequently, such SES should be integral to universities' strategic planning and resource distribution priorities, highlighting the interaction necessary between top management and SES.

The study also illuminates the significance of interactions between external collaborations and the broader entrepreneurial ecosystem's role in augmenting SES

effectiveness. Engaging with industry, governmental bodies, and other academic institutions can significantly enrich the support system available to student entrepreneurs, offering additional resources, expertise, and networking avenues. As Cunningham, Lehmann, and Menter (2022) suggest, this not only bolsters technology transfer and the commercialisation of university innovations but also vitalises the entrepreneurial ecosystem.

Notably, the variability in SES across different universities, shaped by their unique geographical and historical contexts, signals that a uniform approach to supporting student entrepreneurs may be suboptimal. Instead, a contextually adapted strategy, leveraging inherent strengths and addressing particular challenges is advised. This perspective is reinforced by Fichter and Tiemann (2018), who highlight the necessity for bespoke strategies in SES implementation tailored to the distinctive attributes of each institution.

Building on this foundation, we further recommend fostering increased interaction and cooperation between universities themselves to share the effects of longer tradition, historical context, and economies of scale particularly between “most active” and “least active” institutions in terms of SES. Such collaboration can serve as a conduit for transferring knowledge, resources, and best practices enabling institutions that are less active in providing SES to benefit from the experiences and frameworks of their more established counterparts. Crucially, these cooperative efforts should be designed to ensure a win-win outcome wherein all participating universities can achieve mutual benefits. This approach not only augments the individual strategies of each institution but also contributes to a more cohesive and effective national or regional ecosystem for student entrepreneurship support.

Research Limitations and Future Research

From an ecosystem perspective, our study presents a nuanced understanding of the interactions between various elements in a U-BEE that contribute to fostering entrepreneurship among students. The strength of this research lies in its comprehensive methodology, employing a multiple case study design, that offers in-depth and contextual insights into SES across different university settings. The inclusion of diverse voices through semi-structured interviews with key informants from eight universities enriches the analysis and provides a multifaceted view of the U-BEE.

Nonetheless, the study’s qualitative approach and the specific selection of universities introduce limitations, potentially affecting the generalisability of our findings across the full array of South African public universities and their applicability to other contexts in developing countries. Our initial assessment of universities’ engagement in SES, based on internet searches, may suffer from bias due to the varying quality of university websites. Although our research captures the nuances of SES in the selected institutions, the diversity in resources, locations, and historical backgrounds of these universities

warrants caution in generalising our findings. Furthermore, the focus on interviews with internal staff members excludes insights from external stakeholders, who are pivotal in shaping a supportive environment for student entrepreneurs within a broader ecosystem.

Future research could consider interviewing informants from all 26 public universities in South Africa to make more in-depth comparisons. In addition, future research should consider the entire U-BEE and the support provided to other internal and external stakeholders, such as university staff, spin-off entrepreneurs, and entrepreneurs outside the university system. Our qualitative research findings can inspire further studies, generating theoretical hypotheses about the efficacy of SES. For instance, these hypotheses can be quantitatively tested to gauge SES's influence on metrics like performance, success rates, and student entrepreneurship development. Furthermore, it can also be tested whether the SES offered and the way it is structured, influences the mindsets of students to act more entrepreneurially, as well as their intentions to establish their own businesses.

Moreover, our analysis revealed notable differences in terms of age, scale, geographical and historical context, and staff/student ratios among the “most active” and “least active” universities. These observations suggest that factors such as institutional age, scale, and location (urban vs. rural, previously disadvantaged vs. non-previously disadvantaged) may play significant roles in shaping the extent and effectiveness of U-BEEs and their SES offerings. However, being a qualitative study, its scope is limited regarding the causal relationships and the relative impact of these factors on SES. While we have identified and described possible patterns and correlations, our methodology did not extend to a rigorous analysis of causality or to disentangling the potential multicollinearity among the observed factors. Future studies could quantitatively assess the strength of these relationships and their individual contributions to SES effectiveness.

Contribution and Conclusion

By examining the intricate dynamics within South African U-BEEs, our research underscores the importance of systemic thinking in enhancing SES, providing critical insights for developing more effective support structures for student entrepreneurs. Our findings advocate a holistic approach that leverages ecosystem interdependencies and interactions, crucial for fostering innovation and sustainable student ventures within the South African context. Adopting a holistic approach highlights the need for further exploration of ecosystem dynamics to support a thriving student entrepreneurship landscape in the region.

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Competing Interests

The authors declare that they have no financial or personal relationships which may have inappropriately influenced their writing of this article.

Author Contributions

All authors contributed to the conceptualisation of the study and the methodological choices made. The first author conducted the research, which included reviewing the literature, collecting, analysing, and interpreting the data. The second author supervised the research project and all authors provided advice while undertaking the research. The first two authors drafted the final manuscript and it was reviewed and edited by all authors.

Ethical Considerations

The necessary ethics approval was obtained before the collection of the data.

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Data Availability

The data that supports the findings of the study are available upon reasonable request from the first author. The data are not publicly available due to containing information that could compromise the privacy of the informants in our study.

Disclaimer

The views and opinions expressed in this article are those of the authors and participants interviewed and do not necessarily reflect the official policy or position of the affiliated agencies of the authors.

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