



Strategic Pathways For Entrepreneurial-Intended Universities: Insights From Global Best Practices

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ABSTRACT

South African higher education institutions have embarked on a strategic transformation towards becoming entrepreneurial hubs to contribute to the local economy. This study undertook a comprehensive systematic review of global literature on established entrepreneurial university models, identifying key indicators critical for advancing entrepreneurial agendas within academic institutions. These indicators were further triangulated with the country's grassroots reality to further assess the situation for possible adoption, using the University of Venda as a case study. Through a simple random sampling technique, 520 participants were identified from the University's student population for the study and data was collected using a 5-point Likert scale questionnaire. An ordinal regression analysis was employed to examine the predictive influence of the identified variables on entrepreneurial transformation. Results indicated that all three indicators—entrepreneurial support, entrepreneurship education, and research enterprise—were statistically significant predictors at the $p = 0.00$ level. Entrepreneurial support demonstrated the highest predictive strength, followed by entrepreneurship education, while research enterprising exhibited the least influence. The finding emphasizes the need for stakeholders to channel investments towards areas of high predictive potential to accelerate the entrepreneurial transformation of universities. Future research should focus on context-specific and regionally adaptive indicators to further refine strategies and ensure alignment with the unique institutional characteristics, ultimately enabling more effective policy formulation and implementation in the entrepreneurial academic landscape.

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INTRODUCTION

The concept of an entrepreneurial university has gained global traction due to its strategic role in driving knowledge creation, research and innovation, and stimulating economic development.¹ Such institutions serve as catalysts for fostering entrepreneurial mindsets and actions, which are vital for enhancing competitiveness, wealth creation, and much-needed jobs through the integration of research, innovation and knowledge transfer as well as through other actions with the potential of positively

¹ David A. Kirby, Maribel Guerrero, and David Urbano, "Making Universities More Entrepreneurial: Development of a Model," *Canadian Journal of Administrative Sciences / Revue Canadienne Des Sciences de l'Administration* 28, no.3(2011): 302–16; A. Fayolle and D. Redford, *Handbook on the Entrepreneurial University*, Elgar Original Reference (Edward Elgar, 2014); Rhiannon Pugh et al., "The Entrepreneurial University and the Region: What Role for Entrepreneurship Departments?," *European Planning Studies* 26, no. 9 (September 2, 2018): 1835–55, <https://doi.org/10.1080/09654313.2018.1447551>.

impacting local communities.² Added to this is the concept's ability to foster leadership through the processes of generating new knowledge and actions that could be pivotal to competitive wealth creation, ultimately eradicating inequality and poverty which is highest in rural areas.³ Recognizing these critical roles and benefits, universities worldwide have increasingly sought to position themselves as entrepreneurial-driven institutions, capable of cultivating business acumen among their constituency communities and expanding their socio-economic impact both locally and globally.⁴ There is no universally accepted framework and determinants for achieving this transformation, however, recent scholarship has identified numerous indicators that can guide universities in their journey toward becoming entrepreneurial hubs.⁵ There is, however, a notable gap in the literature concerning this concept in the context of rural-based universities, particularly in understanding how these indicators align with the unique challenges and opportunities faced by such institutions. Using the University of Venda context as a case analysis, this paper attempts to address the knowledge gaps by exploring and distilling any specific strategies that can effectively transform a rural-based institution into an entrepreneurial university. Drawing on a comprehensive review of existing literature, this study seeks to distill key insights that are relevant not only to the University of Venda but also to other universities across the country and beyond.

The subsequent sections of this paper, present an overview of the intersection between entrepreneurship and higher education, followed by an exploration of expected core functions of an entrepreneurial university. The discussions will summarise global indicators identified as essential for fostering entrepreneurship in higher education. The methodology employed in this study is outlined and the findings are presented, demonstrating how these global indicators align with the University of Venda's entrepreneurial ecosystem. The paper concludes with a discussion of the results, providing recommendations for policy, practice, and further research to guide rural-based universities in their pursuit of entrepreneurial aspirations and excellence.

LITERATURE REVIEW

Entrepreneurship Imperatives

In recent decades, entrepreneurship has emerged as a critical driver of sustainable development, addressing the complex interplay of social, economic, and environmental challenges in an increasingly globalized world. It is widely recognized for its capacity to foster innovation and enhance productivity by optimizing the use of available resources.⁶ Entrepreneurial knowledge and skills are fundamental in the creation of new products and services that not only meet economic demands but also stimulate

² Kirby, Guerrero, and Urbano, "Making Universities More Entrepreneurial: Development of a Model"; Sbonelo Gift Ndlovu et al., "Contextualising Entrepreneurship as a Panacea to Youth Unemployment in South Africa," *Prizren Social Science Journal* 8, no. 1 (April 30, 2024); Matthias Menter, "From Technological to Social Innovation: Toward a Mission-Reorientation of Entrepreneurial Universities," *The Journal of Technology Transfer* 49, no. 1 (February 21, 2024): 104–18.

³ Menter, "From Technological to Social Innovation: Toward a Mission-Reorientation of Entrepreneurial Universities"; Khaula Alkaabi, Veland Ramadani, and Jusuf Zeqiri, "Universities, Entrepreneurial Ecosystem, and Family Business Performance: Evidence from the United Arab Emirates," *Journal of the Knowledge Economy* 15, no. 2 (April 21, 2023): 5511–38.

⁴ Joanne Larty, Sarah Jack, and Nigel Lockett, "Building Regions: A Resource-Based View of a Policy-Led Knowledge Exchange Network," *Regional Studies* 51, no. 7 (July 3, 2017): 994–1007; Dimitrios G. Ierapetritis, "Discussing the Role of Universities in Fostering Regional Entrepreneurial Ecosystems," *Economies* 7, no. 4 (December 16, 2019): 119; Douglas Wegner et al., "University Entrepreneurial Push Strategy and Students' Entrepreneurial Intention," *International Journal of Entrepreneurial Behavior & Research* 26, no. 2 (November 5, 2019): 307–25; Davide Hahn et al., "The Impact of Entrepreneurship Education on University Students' Entrepreneurial Skills: A Family Embeddedness Perspective," *Small Business Economics* 55, no. 1 (June 12, 2020): 257–82.

⁵ Olufunmilola Dada, Sarah Jack, and Magnus George, "University–Business Engagement Franchising and Geographic Distance: A Case Study of a Business Leadership Programme," *Regional Studies* 50, no. 7 (July 2, 2016): 1217–31; Larty, Jack, and Lockett, "Building Regions: A Resource-Based View of a Policy-Led Knowledge Exchange Network."

⁶ Edward J. Malecki, "Chapter 3 Entrepreneurs, Networks, and Economic Development: A Review of Recent Research," in *Reflections and Extensions on Key Papers of the First Twenty-Five Years of Advances*, ed. J. Katz and A. Corbett (Bingley: Emerald Publishing Limited, 2018), 71–116; László Szerb and William N Trumbull, "Entrepreneurship Development in Russia: Is Russia a Normal Country? An Empirical Analysis," *Journal of Small Business and Enterprise Development* 25, no. 6 (2018): 902–29; Mercy Ejoywokeoghene Ogbari et al., "Imperatives Of Entrepreneurship Development Studies On University Reputation In Nigeria," *Journal of Entrepreneurship Education* 22 (2019); Thanyani S Madzivhandila and Mazanai Musara, "Taking Responsibility for Entrepreneurship Development in South Africa: The Role of Local Municipalities," *Local Economy: The Journal of the Local Economy Policy Unit* 35, no. 3 (May 1, 2020): 257–68.

job creation and economic growth.⁷ In this context, Pierrakis and Otchia note the pivotal nature of sustained investment in entrepreneurship, highlighting its central role in shaping future technologies and industries.⁸ This perspective aligns with Yudaeva's earlier assertion that the entrepreneurial sector holds the key to the future, positing that job creation and the fulfilment of global needs in the 21st century will be primarily driven by entrepreneurial initiatives.⁹

Scaling up investments in entrepreneurship education, skills development, and capacity building, therefore, is crucial for fostering economic resilience and prosperity. This strategic emphasis on entrepreneurship offers a significant opportunity for economic policymakers, particularly in nations facing severe economic challenges, such as South Africa, where leveraging entrepreneurial capacity may serve as a critical pathway for job creation, sustainable economic recovery and long-term growth.

Entrepreneurial University in the Globalised World

Higher education is globally recognized as a crucial driver of knowledge generation and dissemination and, hence, has the potential to serve as a fundamental channel through which entrepreneurial capacity can be stimulated, thereby promoting economic growth.¹⁰ Empirical studies have consistently demonstrated that economies renowned for their successful entrepreneurial ecosystems - such as the USA, Sweden, Germany, Canada, and China - actively integrate entrepreneurship into their institutions of higher learning, fostering entrepreneurial skills and innovation on a significant scale.¹¹ Their successes, combined with their strategic objectives of enhancing societal impact through entrepreneurial initiatives, have inspired a global shift toward entrepreneurial universities.¹² African countries, too, are increasingly recognizing the value of this approach.

In Africa, nations, such as Nigeria, Zimbabwe, Uganda, and Kenya have incorporated entrepreneurship into higher education curricula, aiming to facilitate knowledge transfer and skills development.¹³ Institutions like, Midlands State University and Zimbabwe Ezekiel Guti University in Zimbabwe, as well as the University of Calabar in Nigeria, have made entrepreneurship courses compulsory and, in some instances, complemented them with practical skills-building initiatives; despite these efforts, the benefits remain elusive and inconclusive, as these countries continue to

⁷ Yannis Pierrakis, "Public Policies and Public Programs with a Regional Impact in Promoting Entrepreneurship," 2016, 122–50; Christian S Otchia, "On Promoting Entrepreneurship and Job Creation in Africa: Evidence from Ghana and Kenya," *Economics Bulletin* 39, no. 2 (2019): 908–18; Ishmael Obaeko Iwara, "Towards a Model for Successful Enterprises Centred on Entrepreneurs Exogenous and Endogenous Attributes: Case of Vhembe District, South Africa" (2020).

⁸ Pierrakis, "Public Policies and Public Programs with a Regional Impact in Promoting Entrepreneurship"; Otchia, "On Promoting Entrepreneurship and Job Creation in Africa: Evidence from Ghana and Kenya."

⁹ Ksenia Yudaeva, "Russia's Perspective on G20 Summitry," *Russia's G20 Summit: St Petersburg* 2013 (2013): 36–37.

¹⁰ David Audretsch, "From the Entrepreneurial University to the University for the Entrepreneurial Society," *The Journal of Technology Transfer* 39, no. 3 (2014): 313–21; Martin Carree, Antonio Malva, and Enrico Santarelli, "The Contribution of Universities to Growth: Empirical Evidence for Italy," *The Journal of Technology Transfer* 39, no. 3 (2014): 393–414; Erik Lehmann and Sarah Stockinger, "Entrepreneurship in Higher Education: The Impact of Competition-based Policy Programmes Exemplified by the German Excellence Initiative," *Higher Education Quarterly* 73, no.1(2019): 70–84; Sunday Tula et al., "Entrepreneurial Ecosystems in the USA: A Comprehensive Review with European Models," *International Journal of Management & Entrepreneurship Research* 6, no. 2 (2024): 451–66.

¹¹ Per Blenker et al., "A Framework for Developing Entrepreneurship Education in a University Context," *International Journal of Entrepreneurship and Small Business* 5, no. 1 (2008): 45; T Van Dijk and C. Mensch, "Entrepreneurship Education in Swedish Compulsory Schools: The Perception and Implementation from an Educator's Viewpoint," *Lund University School of Economics and Management, Sweden*, 2015; European Commission, *Entrepreneurship 2020 Action Plan: Reigniting the Entrepreneurial Spirit in Europe* (Brussels: Consortium for Entrepreneurship Education, 2013); Z. Yue, *Preferential Policies Lure Returnee Entrepreneurs*, 2017, http://www.chinadaily.com.cn/china/2017-08/09/content_30383109.htm.

¹² Pugh et al., "The Entrepreneurial University and the Region: What Role for Entrepreneurship Departments?"

¹³ Adekunle Solomon Olorundare and David Jimoh Kayode, "Entrepreneurship Education in Nigerian Universities: A Tool for National Transformation," *Asia Pacific Journal of Educators and Education* 29, no. 8 (2014): 155–75; Patient Rambe, Takawira Munyaradzi Ndofirepi, and Dennis Yao Dzansi, "Influence of Entrepreneurial Education and Technological Creativity on Entrepreneurial Intentions of Students in Zimbabwe: A Theoretical Perspective," in *European Conference on Innovation and Entrepreneurship* (Academic Conferences International Limited, 2015), 576; Nwite Onuma, "Entrepreneurship Education in Nigerian Tertiary Institutions: A Remedy to Graduates Unemployment," *British Journal of Education* 4, no. 5 (2016): 16–28; Janet Kibera, "Influence Of Integrated Information Communication Technology On Public Education Institution," *Journal of Public Relations* 1, no. 1 (August 16, 2021): 1–13; Federal Republic of Nigeria (FRN), *National Policy on Education* (Lagos: NERDC Press, 2013); G. van Zyl, *Entrepreneurship: Why It Must Be Included in South Africa's Education Curriculum*, 2018, <https://www.biznews.com/thought-leaders/2018/02/01/entrepreneurship-education-curriculum>.

grapple with high rates of graduate unemployment and sluggish economic development.¹⁴ This concern merits further scientific interrogations of the notion, as well as a conceptualisation of practical interventions.

In South Africa, universities have established entrepreneurial incubation systems, such as the Johannesburg Business School Centre for Entrepreneurship, the DUT Centre for Entrepreneurship & Innovation, and the UCT Bertha Centre for Social Innovation & Entrepreneurship. While these initiatives foster entrepreneurship, their narrow reach - often enrolling only a small percentage of students - limits their capacity to develop robust entrepreneurial ecosystems across broader academic contexts and student communities, thus, a more comprehensive approach to cultivating entrepreneurial universities in South Africa is needed.

Like many other South African institutions, the University of Venda (Univen), located in the rural area is striving to become an entrepreneurial hub. Beginning in 2018/19, Univen has actively encouraged entrepreneurial initiatives among its academics and students, laying the groundwork for its 2021-2025 Strategy and Integrated Entrepreneurship, Innovation, and Biodiversity Plan (UIEIBP). This plan consolidates the University's internal and external networks with the overarching goal of enhancing its contribution to South Africa's rural economic growth. Univen's approach is particularly noteworthy because, unlike most entrepreneurial universities, it operates in a rural context, hence, aiming to benefit not only students and staff but also grassroots communities - a rarity in South African higher education. Netshilinganedza perceives this community-centred entrepreneurship model as a potential catalyst for sustainable livelihoods among students and rural populations.¹⁵

Univen's entrepreneurial transformation, however, remains in its infancy, despite these promising developments. The lack of empirical research on specific indicators, frameworks, and models required to successfully transition rural-based universities into entrepreneurial institutions, poses a significant challenge. Without such foundational knowledge, Univen's transformation risks falling short of its potential - this motivated the current study which explores the necessary conditions and strategies that can support the evolution of rural universities, like Univen, into fully-fledged entrepreneurial institutions.

Entrepreneurial University Strategic Merits

The conceptualization of an entrepreneurial university varies across the academic discourse, but a central aim consistently emerges: the pursuit of economic development. Audretsch and Keilbach conceptualise that an entrepreneurial university - fosters entrepreneurial intentions, leads innovative thinking, as well as establishes institutions and capital that support entrepreneurship.¹⁶ Building on these intentions, recent studies have expanded the scope of an entrepreneurial university's roles, identifying key functions such as - the development of curricula that impart both theoretical and practical entrepreneurial knowledge; the commercialization of research projects, and the creation of specialized units dedicated to technological and practical skills transfer.¹⁷ Additionally, these institutions play a significant role in cultivating entrepreneurial mindsets through various initiatives that promote entrepreneurial behaviour.¹⁸ Entrepreneurial universities actively engage with external

¹⁴ Longe, "Graduate Unemployment in Nigeria : Causes , Consequences and Remediable Approaches," 2018; Stephen Mwenje, "The Challenge of Graduate Unemployment: A Case of University Graduates in Mutare, Zimbabwe," *Selected Topics in Humanities and Social Sciences Vol. 6 4* (September 18, 2021): 34–42; Phelista Wangui Njeru and Mwangi Peter Wandari, "Unemployment Intervention in Africa: A Case Study on Mount Kenya University's Graduate Enterprise Academy," in *Enterprise and Economic Development in Africa* (Emerald Publishing Limited, 2021), 211–26.

¹⁵ Tendani Robert Netshilinganedza, "Factors Influencing the Attitudes of Final Year Undergraduate Students towards Entrepreneurship as a Career Option: A Case-Study at the University of Venda in Limpopo Province of South Africa" (2020).

¹⁶ Audretsch, "From the Entrepreneurial University to the University for the Entrepreneurial Society."

¹⁷ Nicola Baldini et al., "Organisational Change and the Institutionalisation of University Patenting Activity in Italy," *SSRN Electronic Journal*, 2010; Andrew Johnston and Robert Huggins, "Drivers of University–Industry Links: The Case of Knowledge-Intensive Business Service Firms in Rural Locations," *Regional Studies* 50, no. 8 (August 2, 2016): 1330–45; Mathew J. Manimala, "Promoting Entrepreneurship: The Role of Educators," in *Entrepreneurship Education* (Singapore: Springer Singapore, 2017), 393–407.

¹⁸ Tayyab Anjad, Shamsul Huda Binti Abdul Rani, and Shiza Binti Sa'atar, "Entrepreneurship Development and Pedagogical Gaps in Entrepreneurial Marketing Education," *The International Journal of Management Education* 18, no. 2 (July 2020): 100379.

stakeholders - public and private organizations - positioning themselves as key actors in community development and economic enhancement.¹⁹

This perspective aligns with Guerrero and Urban, who emphasize the cruciality of sustained partnerships, collaborations, networks, and interactions with both public and private sectors to link education and research, directly to economic growth.²⁰ This mindset suggests that an entrepreneurial university is characterized by several key determinants: the facilitation of knowledge transfer; the provision of business development support services, and the identification of sustainable enterprises for both students and local communities. It can be attested that these processes resonate with the University of Venda's entrepreneurship promotion aspirations and strategies, even though little is known about contextual scientific frameworks that can effectively guide its transformation efforts.

Entrepreneurial university indicators

A review of the literature on the determinants of entrepreneurial universities reveals three overarching indicators that are integral to their development and success. As outlined in Table 1, the first indicator is entrepreneurship education, which entails the integration of entrepreneurship-focused courses and curricula aimed at building foundational knowledge, as well as the establishment of incubation systems that foster practical skills development. The second indicator, entrepreneurial support initiatives, emphasizes a university's role in promoting experiential learning through internships and mentorship programs, facilitating entrepreneurship interactions and networking opportunities, and providing seed funding to support the creation of new enterprises. The third and final indicator is research enterprising, which refers to promoting and advancing solution-oriented relevant research in specialized entrepreneurial areas, as well as the subsequent implementation, commodification, and commercialization of research outputs. Together, these indicators provide a comprehensive framework through which universities can systematically enhance their entrepreneurial capacity and contribute to broader economic and social development.

Table 1: Key Global Indicators of Entrepreneurship Promotion in Higher Education

Indicators	Initiatives	Motivation
Entrepreneurship education	<i>Course/curriculum for knowledge building</i>	Develop and expand the availability of entrepreneurship-related courses tailored either for all students or specifically targeted groups, ensuring that the offerings are strategically aligned with institutional goals. ²¹ Instruction in entrepreneurship is critical, as it equips individuals with foundational knowledge and key concepts that are instrumental for successfully navigating entrepreneurial ventures. ²²
	<i>Incubation system for skills development &</i>	Foster a collaborative framework that supports multidisciplinary projects, facilitating synergies, innovation, and breakthroughs while cultivating a

¹⁹ Henry Etzkowitz et al., "The Future of the University and the University of the Future: Evolution of Ivory Tower to Entrepreneurial Paradigm," *Research Policy* 29, no. 2 (February 2000): 313–30, [https://doi.org/10.1016/S0048-7333\(99\)00069-4](https://doi.org/10.1016/S0048-7333(99)00069-4).

²⁰ Maribel Guerrero and David Urbano, "The Development of an Entrepreneurial University," *The Journal of Technology Transfer* 37, no. 1 (February 27, 2012): 43–74, <https://doi.org/10.1007/s10961-010-9171-x>.

²¹ Åsa Lindholm Dahlstrand and Eva Berggren, "Chapter 4 Linking Innovation and Entrepreneurship in Higher Education: A Study of Swedish Schools of Entrepreneurship," 2010, 35–50; Magnus Hoppe, Mats Westerberg, and Eva Leffler, "Educational Approaches to Entrepreneurship in Higher Education," *Education + Training* 59, no.7/8 (August 14, 2017):751–67; F. Bellotti et al., "Designing a Course for Stimulating Entrepreneurship in Higher Education through Serious Games," *Procedia Computer Science* 15(2012):174–86.

²² Vesa P. Taatila, "Learning Entrepreneurship in Higher Education," *Education + Training* 52, no. 1 (February 16, 2010): 48–61.; Hoppe, Westerberg, and Leffler, "Educational Approaches to Entrepreneurship in Higher Education"; Amador Durán-Sánchez et al., "Mapping of Scientific Coverage on Education for Entrepreneurship in Higher Education," *Journal of Enterprising Communities: People and Places in the Global Economy* 13, no. 1/2 (May 31, 2019): 84–104; Heiko Bergmann et al., "The Climate for Entrepreneurship at Higher Education Institutions," *Research Policy* 47, no. 4 (May 2018): 700–716.

	<p><i>Practice Protocols</i></p>	<p>dynamic environment that promotes creativity and entrepreneurial advancement.²³</p> <p>Establish an integrated system led by subject-matter experts, encompassing a diverse array of activities such as entrepreneurial capacity-building programs—both in soft skills and technical expertise—alongside opportunities for internal and external networking, business marketing strategies, and resource mobilization to support enterprise development.²⁴</p>
	<p><i>Entrepreneurship awareness programmes</i></p>	<p>Organize diverse entrepreneurship initiatives through high-impact events such as conferences, workshops, and seminars, aimed at garnering knowledge exchange and entrepreneurial development.²⁵</p> <p>Appoint dedicated faculty entrepreneurship officers and academic mentors to offer expert guidance, while also coordinating the various entrepreneurial initiatives available to students.²⁶</p> <p>Increase the frequency of targeted promotional efforts and events that facilitate networking, knowledge-sharing, and entrepreneurial interaction, thereby, creating a vibrant ecosystem for emerging innovators.²⁷</p>
<p>Entrepreneurial support initiatives</p>	<p><i>Internship and mentorships</i></p>	<p>Integrate aspiring entrepreneurs into real-world market systems, providing them with opportunities to serve, learn, and apply their entrepreneurial knowledge in practical, dynamic environments.²⁸</p> <p>Establish a comprehensive support system that connects students with experienced mentors and key stakeholders in entrepreneurship development, ensuring access to critical resources, including potential seed funding for enterprise start-ups.²⁹</p>

²³ B El-Khasawneh, “Entrepreneurship Promotion at Educational Institutions: A Model Suitable for Emerging Economies,” *WSEAS Transactions on Business and Economics* 2, no. 5 (2008): 27–35; I Made Sudana et al., “Business Incubator Training Management Model to Increase Graduate Competency,” *Benchmarking: An International Journal* 26, no. 3 (March 28, 2019): 773–87.

²⁴ El-Khasawneh, “Entrepreneurship Promotion at Educational Institutions: A Model Suitable for Emerging Economies”; Joris J. Ebbers, “Networking Behavior and Contracting Relationships among Entrepreneurs in Business Incubators,” *Entrepreneurship Theory and Practice* 38, no. 5 (September 1, 2014): 1–23; Dag Bennett, Diana Pérez-Bustamante Yábar, and José Ramón Saura, “University Incubators May Be Socially Valuable, but How Effective Are They? A Case Study on Business Incubators at Universities,” 2017, 165–77, https://doi.org/10.1007/978-3-319-47949-1_11; Anne Bøllingtoft, “The Bottom-up Business Incubator: Leverage to Networking and Cooperation Practices in a Self-Generated, Entrepreneurial-Enabled Environment,” *Technovation* 32, no. 5 (May 2012): 304–15.

²⁵ Bellotti et al., “Designing a Course for Stimulating Entrepreneurship in Higher Education through Serious Games”; Mohd Nizam Ab Rahman et al., “Engineering Students towards Entrepreneurship Awareness,” *International Journal of Academic Research in Accounting, Finance and Management Sciences* 2, no. 4 (2012): 272–82.

²⁶ Sascha G. Walter, K. Praveen Parboteeah, and Achim Walter, “University Departments and Self-Employment Intentions of Business Students: A Cross-Level Analysis,” *Entrepreneurship Theory and Practice* 37, no. 2 (March 1, 2013): 175–200.

²⁷ Áurea Sousa et al., “Entrepreneurship Promotion in Higher Education Institutions,” *Journal of Entrepreneurship, Business and Economics* 5, no. 1 (2016): 157–84; Mariluz Fernandez-Alles et al., “TTO Characteristics and University Entrepreneurship: A Cluster Analysis,” *Journal of Science and Technology Policy Management* 10, no. 4 (October 16, 2019): 861–89.

²⁸ Vhonani Olive Netshandama, Ishmael Obaeko Iwara, and Ndumulelo Innocent Nelwamondo, “Social Entrepreneurship Knowledge Promotion Amongst Students in a Historically Disadvantaged Institution of Higher Learning,” *Journal of Entrepreneurship Education* 24 (2021): 1–12.

²⁹ Roslyn Russell, Mary Atchison, and Robert Brooks, “Business Plan Competitions in Tertiary Institutions: Encouraging Entrepreneurship Education,” *Journal of Higher Education Policy and Management* 30, no. 2 (May 2008): 123–38; Bergmann et al., “The Climate for Entrepreneurship at Higher Education Institutions”; Lehmann and Stockinger, “Entrepreneurship in Higher

		It serves as a source of inspiration, holistic perspective and emotional support and provides practical advice to entrepreneurs with a view to enhance entrepreneurial performance, and promote economic growth and sustainable development.
	<i>Entrepreneurship competition platforms</i>	Facilitate structured channels that foster the convergence of individuals into a dynamic entrepreneurial community, encouraging collaboration and idea exchange. ³⁰ Enable both internal and external stakeholders to contribute to and compete within the ecosystem, thereby cultivating and enriching a vibrant entrepreneurial environment. ³¹
	<i>Provision of seed funding for enterprises.</i>	Facilitate access to financial literacy programs and entrepreneurship agencies to support funding opportunities. ³² Provide financial backing for student-driven innovative ideas, nurturing them into successful ventures. ³³ Allocate seed funding strategically, aligned with the entrepreneurial aspirations and intentions of graduates. ³⁴
Research enterprising	<i>Deepening and motivating solution-driven research in niche entrepreneurial areas</i>	Pursue more context-specific, relevant, and rigorous entrepreneurship research to deepen and expand the knowledge base. ³⁵ Encourage active engagement in scholarship, with a focus on understanding specific societal needs and identifying best practices for tailored solutions. ³⁶
	<i>Implementing, commodification and commercialising research outputs</i>	Strive to bridge the gap between academic research and practical application by leveraging experiential projects

Education: The Impact of Competition-based Policy Programmes Exemplified by the German Excellence Initiative”; Ahmad Yani, Suherlan, and Hizbul Khootimah Az Zaakiyyah, “The Importance of Mentorship in Stimulating the Growth and Success of Entrepreneurial Business Entities,” *Journal of Contemporary Administration and Management (ADMAN)* 2, no. 1 (February 1, 2024): 337–42.

³⁰ Linda Quirke and Scott Davies, “The New Entrepreneurship in Higher Education: The Impact of Tuition Increases at an Ontario University,” *Canadian Journal of Higher Education* 32, no. 3 (December 31, 2002): 85–109.

³¹ Lehmann and Stockinger, “Entrepreneurship in Higher Education: The Impact of Competition-based Policy Programmes Exemplified by the German Excellence Initiative.”

³² Bart Van Looy et al., “Entrepreneurial Effectiveness of European Universities: An Empirical Assessment of Antecedents and Trade-Offs,” *Research Policy* 40, no. 4 (May 2011): 553–64; Thobile N Radebe, “The Challenges/Barriers Preventing the South African Youth in Becoming Entrepreneurs: South African Overview,” *Journal of Economics and Behavioral Studies* 11, no. 4(J) (September 26, 2019): 61–70; Elizabeth Chinomona, Babatunde A Popoola, and Oluwabanmi O Popoola, “The Influence of Entrepreneurial Training, Access to Finance, Entrepreneurial Capacity, Entrepreneurial Atmosphere on Youth Entrepreneurship,” *African Journal of Business and Economic Research* 15, no. 1 (2020): 81.

³³ Yani, Suherlan, and Az Zaakiyyah, “The Importance of Mentorship in Stimulating the Growth and Success of Entrepreneurial Business Entities.”

³⁴ Einar Rasmussen and Odd Jarl Borch, “University Capabilities in Facilitating Entrepreneurship: A Longitudinal Study of Spin-off Ventures at Mid-Range Universities,” *Research Policy* 39, no. 5 (June 2010): 602–12, Bergmann et al., “The Climate for Entrepreneurship at Higher Education Institutions.”

³⁵ Durán-Sánchez et al., “Mapping of Scientific Coverage on Education for Entrepreneurship in Higher Education”; Yani, Suherlan, and Az Zaakiyyah, “The Importance of Mentorship in Stimulating the Growth and Success of Entrepreneurial Business Entities.”

³⁶ Georg von Graevenitz, Dietmar Harhoff, and Richard Weber, “The Effects of Entrepreneurship Education,” *Journal of Economic Behavior & Organization* 76, no. 1 (October 2010): 90–112; Francisco Liñán, Juan Carlos Rodríguez-Cohard, and José M. Rueda-Cantucho, “Factors Affecting Entrepreneurial Intention Levels: A Role for Education,” *International Entrepreneurship and Management Journal* 7, no. 2 (June 30, 2011): 195–218; Durán-Sánchez et al., “Mapping of Scientific Coverage on Education for Entrepreneurship in Higher Education.”

		<p>that allow students to actively engage in entrepreneurial training and learning.³⁷</p> <p>The transition from traditional, transmission-based teaching models to experiential learning approaches that emphasize real-world applicability and equip students with practical, actionable techniques.³⁸</p> <p>Ensure adequate institutional support so that research outcomes can effectively translate into viable new ventures and entrepreneurial initiatives.³⁹</p> <p>Take a proactive role in the commodification and commercialization of the outcomes generated from the research activities of the faculty, staff, and students, fostering a culture of innovation and entrepreneurship.⁴⁰</p>
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Source: Authors elaboration based on literature review

Model Specification

The dependent variable in this study was defined as the entrepreneurial university (EU). To operationalize this variable, the primary roles and functions of an entrepreneurial university, as identified in the extant literature, were utilized as measurement criteria. These roles include - the promotion of entrepreneurship training, the provision of enterprise development support services, and the incubating of sustainable business ventures both among students and within local communities. Consequently, it is proposed that the development and performance of an EU are contingent upon the recurring factors outlined in Table 1. Symbolically, this relationship can be expressed as follows:

$$EU=f(EE, ES, RE).....1$$

where:

- F = Function*
- EE = Entrepreneurship Education*
- ES = Entrepreneurial Support Initiatives*
- RE = Research Enterprising*

Study Area

The University of Venda, one of two public and rural-based universities in South Africa’s Limpopo Province, serves a student population of approximately 16,000. As a rural-based Historically Disadvantaged Institution (HDI), it primarily attracts students from middle- and low-income backgrounds, within the Vhembe District.⁴¹ This District, situated in the northernmost part of the country and bordering Botswana, Mozambique, and Zimbabwe, is predominantly rural and continues to face significant deficits in basic infrastructure and services.⁴²The District’s contribution is 4.4% of

³⁷ Lindholm Dahlstrand and Berggren, “Chapter 4 Linking Innovation and Entrepreneurship in Higher Education: A Study of Swedish Schools of Entrepreneurship.”

³⁸ Taatila, “Learning Entrepreneurship in Higher Education.”

³⁹ Hoppe, Westerberg, and Leffler, “Educational Approaches to Entrepreneurship in Higher Education.”

⁴⁰ Eva Berggren, “The Entrepreneurial University’s Influence on Commercialisation of Academic Research—the Illustrative Case of Chalmers University of Technology,” *International Journal of Entrepreneurship and Small Business* 12, no. 4 (2011): 429–44; Henry Etzkowitz, “Anatomy of the Entrepreneurial University,” *Social Science Information* 52, no. 3 (September 5, 2013): 486–511; Elvira Cerver Romero, João J. M. Ferreira, and Cristina I. Fernandes, “The Multiple Faces of the Entrepreneurial University: A Review of the Prevailing Theoretical Approaches,” *The Journal of Technology Transfer* 46, no. 4 (August 31, 2021): 1173–95.

⁴¹ Netshandama, Iwara, and Nelwamondo, “Social Entrepreneurship Knowledge Promotion Amongst Students in a Historically Disadvantaged Institution of Higher Learning.”

⁴² Khazamula Chauke Phineas, Dennis Nekhavhambe Thizwilondi, and Kudakwashe Pfumayaramba Tichaona, “An Assessment of Support Provided to Smallholder Farmers: A Case Study of the Vhembe District, South Africa,” *African Journal of Agricultural*

South Africa's agricultural output, 8.4% of its subtropical fruit, and 6.3% of its citrus production, yet, it remains economically challenged, with persistently high rates of enterprise failure, unemployment, and poverty, ultimately motivating the need for a successful entrepreneurial institution that can generate non-academic sustainable solutions in the area.⁴³ The region, rich in biodiversity and natural resources, possesses substantial potential for sustainable business development, however, these economic difficulties highlight the urgent need for targeted support, for example, of an entrepreneurial nature. Establishing resourceful entrepreneurial institutions that focus on capacity-building is essential for generating sustainable livelihoods for students, academics, and grassroots communities in such marginalized areas.

METHODOLOGY

In this study, an illustrative case study design was employed, utilizing a mixed-method survey approach. This design was chosen for its ability to integrate and analyse both quantitative and qualitative data within a single study, providing a robust framework for addressing the research questions. Through this dual methodology, a set of entrepreneurial university indicators were unpacked from the literature and subsequently tested for their similarity and relevance within the context of the University of Venda. The qualitative methodology facilitated the extraction of global indicators from existing literature, while the quantitative methodology allowed for the examination of their applicability and alignment with the unique realities of the University of Venda.

To systematically synthesize the entrepreneurial research, the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines were employed. PRISMA offers a rigorous, evidence-based framework that ensures accuracy and transparency in reporting systematic reviews and meta-analyses by focusing on both pull and push factors influencing a phenomenon.⁴⁴

The application of PRISMA involves four distinct stages. The first stage, identification, involved sourcing 117 scholarly articles on entrepreneurial universities from databases such as Thomson Reuters' Web of Science, Google Scholar, Academic Search Complete, ERIC, and MEDLINE. In the second phase, materials were screened and consolidated, with non-peer-reviewed sources, abstracts, and publications before 2001 being excluded, yielding 81 peer-reviewed, English-language articles. During the third phase, the full texts of these selected articles were reassessed for eligibility, and in the fourth phase, the accepted data were uploaded into Atlas. ti v8 for thematic qualitative analysis. Atlas. ti, known for its capacity to handle large textual datasets, enabled efficient coding, annotation, and thematic clustering, ultimately generating a framework that visually connected key insights.⁴⁵ Based on this analysis, the results were categorized into different themes for interpretation. A 5-point Likert scale was then developed to assess the significance of the recurring factors identified in the literature, with 1 representing the least significant and 5 representing the most significant.

Data collection involved both online surveys (via Google Forms) and one-on-one interviews, drawing responses from 800 participants randomly selected from the University's undergraduate and postgraduate student population. Out of the 673 returned questionnaires, 153 were deemed invalid due to participants' insufficient knowledge of entrepreneurial university concepts, leaving 520 valid responses from participants with strong backgrounds in the subject matter.

Given the non-normal distribution of the dataset, an ordinal regression model—selected for its suitability for non-parametric analysis—was applied to the data. Ordinal regression is particularly valuable for predicting outcomes where the variable exists on an ordinal scale, meaning only the

Research 8, no. 12 (April 4, 2013): 1077–85; Ronald Nyambeni Mudimeli, "Determining the Functionality of Traditional Leadership Councils as Agents of Rural Development in Vhembe District, South Africa" (2019).

⁴³ Iwara, "Towards a Model for Successful Enterprises Centred on Entrepreneurs Exogenous and Endogenous Attributes: Case of Vhembe District, South Africa"; Statistics South Africa (Stat SA), *Quarterly Labour Force Survey*, 2018, <http://www.statssa.gov.za/publications/P0211/P02113rdQuarter2018.pdf>.

⁴⁴ David Moher et al., "Preferred Reporting Items for Systematic Reviews and Meta-Analyses: The PRISMA Statement," *International Journal of Surgery* 8, no. 5 (2010): 336–41, <https://doi.org/10.1016/j.ijsu.2010.02.007>.

⁴⁵ Brigitte Smit, "Atlas. Ti for Qualitative Data Analysis," *Perspectives in Education* 20, no. 3 (2002): 65–75.

relative ordering between values is significant.⁴⁶ The coefficients from the regression analysis were interpreted as changes in the log odds of being in a higher category of the dependent variable, for each unit increase in the independent variable. This provided a nuanced understanding of how each entrepreneurial university indicator influenced the likelihood of progression to a higher category of entrepreneurial activity, accounting for the various independent variables.

PRESENTATION OF FINDINGS

A total of 520 respondents participated in this case study. Youths, defined as individuals aged between 18 and 35, made up 57.7% of the sample, with the remaining percentage comprising adults aged 36 and above. The gender distribution was nearly even, with females representing 50.8% of the respondents, while males accounted for the remaining 49.2%.

Table 2: Participant demography

		Frequency	Percent
Age Category	Youth	300	57.7
	Adult	220	42.3
	Total	520	100.0
Gender	Female	264	50.8
	Male	256	49.2
	Total	520	100.0

Test of normality

The Test of Normality indicated that the data deviated from a normal distribution. Specifically, the Kolmogorov-Smirnov test values for all variables were statistically significant at $p = 0.00$, as detailed in Table 3. According to Mishra et al., data is considered normally distributed, if the significance value exceeds 0.05.⁴⁷ Furthermore, the critical ratios for skewness and kurtosis - calculated as skewness or kurtosis divided by their respective standard errors - fell outside the range of -1.96 to +1.96, reinforcing the conclusion that the data did not follow a normal distribution.

Table 3: Tests of normality

	Kolmogorov-Smirnov^a			Shapiro-Wilk			Skewness Std. Error		Kurtosis Std. Error	
	Statistic	df	Sig.	Statistic	df	Sig.				
EU_LOG	.135	520	.000*	.909	520	.000*	-1.289	.107	3390	.214
EE	.227	520	.000*	.737	520	.000*	-2.8131	.107	5.185	.214
ES	.203	520	.000*	.813	520	.000*	-1.774	.107	4.039	.214
RE	.294	520	.000*	.677	520	.000*	-1.697	.107	1.667	.214

a. Lilliefors Significance Correction

*Statistically significant at the 0.05 level or less.

Model adequacy and reliability

The assessment of model fit, including the test of parallel lines and goodness-of-fit measures, was conducted to evaluate sample adequacy, variable appropriateness, and overall model fitness. As presented in Table 4, the model fitting information revealed a significant level of 0.00, indicating that the ordinal regression analysis appropriately fits the dataset. Additionally, the non-significant results

⁴⁶ Pedro Antonio Gutierrez et al., "Ordinal Regression Methods: Survey and Experimental Study," *IEEE Transactions on Knowledge and Data Engineering* 28, no. 1 (January 1, 2016): 127–46, <https://doi.org/10.1109/TKDE.2015.2457911>.

⁴⁷ Prabhaker Mishra et al., "Descriptive Statistics and Normality Tests for Statistical Data," *Annals of Cardiac Anaesthesia* 22, no. 1 (2019): 67, https://doi.org/10.4103/aca.ACA_157_18.

from the Pearson Chi-Square (p = 0.281) and Deviance Chi-Square (p = 1.00) tests further affirmed the model's fit to the data. The Test of Parallel Lines yielded a probability value of 1.000, which exceeds the 0.05 threshold, thus confirming that the proportional odds assumption was upheld. This result suggests that the explanatory variables were consistent across the different thresholds of the outcome variable.

Table 4: Model adequacy and reliability

Model Fitting Information	Model	-2 Log Likelihood	Chi-Square	df	Sig.
	Intercept Only	1649.386			
	Final	1324.628	324.758	3	.000*
Model Test of Parallel Lines	Model	-2 Log Likelihood	Chi-Square	df	Sig.
	Null Hypothesis	1324.628	.470		
	General	1278.494 ^b	46.134 ^c	112	1.000
Model Goodness-of-Fit			Chi-Square	df	Sig.
	Pearson		3112.003	3067	.281
	Deviance		1128.563	3067	1.000

Link function: Logit. *Statistically significant at the 0.05 level or less.

Ordinal regression analysis

Table 5 displays the Pseudo R-squared statistics, with the Nagelkerke value calculated at 0.470 from the ordinal regression model applied to a dataset of 520 observations and eight independent variables. This indicates that approximately 47% of the variation in the dependent variable, entrepreneurial university, can be attributed to the independent variables - entrepreneurship education, entrepreneurial support, and research enterprising, assuming all other factors remain constant.

Table 5: Ordinal Regression Model Pseudo R-Square

Cox and Snell	.464
Nagelkerke	.470
McFadden	.139
Link function: Logit.	

The ordinal regression model used to investigate the relationship between the entrepreneurial university and the three predictor variables, based on a survey dataset of 520 observations, is specified as follows:

$$\widehat{Eu}_i = 14.103 + 6.278\widehat{EE}_i + 10.506\widehat{ES}_i + 1.684\widehat{RE}_i$$

Entrepreneurship education emerged as a significant predictor of an entrepreneurial university with a p-value of 0.00. For each one-unit increase in entrepreneurial education, there is a predicted increase of 6.70 in the log odds of achieving a higher level of entrepreneurial status. Similarly, entrepreneurial support Initiatives also proved to be a significant predictor (p=0.00), with each one-unit increase in the parameter associated with a predicted increase of 10.50 in the log odds of attaining a higher level of entrepreneurial engagement. Research enterprising was likewise a significant predictor (p=0.00), where each one-unit increase in it, corresponds to a predicted increase of 1.68 in the log odds of progressing to a higher level of entrepreneurial university status.

Table 6: Ordinal Regression Model – dependent and independent variables (n=520)

Parameter Estimates		Estimate	Std. Error	Wald	df	Sig.	95% Confidence Interval	
							Lower Bound	Upper Bound
Threshold	[Dependent_LOG = 1,20]	2.263	1.209	3.507	1	.061	-.105	4.632
	[Dependent_LOG = 1,80]	3.186	.922	11.955	1	.001	1.380	4.993
	[Dependent_LOG = 2,00]	3.934	.797	24.358	1	.000	2.372	5.496
	[Dependent_LOG = 2,40]	5.221	.707	54.603	1	.000	3.836	6.606
	[Dependent_LOG = 2,60]	5.476	.699	61.375	1	.000	4.106	6.846
	[Dependent_LOG = 3,00]	6.259	.690	82.200	1	.000	4.906	7.613
	[Dependent_LOG = 3,20]	7.138	.696	105.079	1	.000	5.773	8.503
	[Dependent_LOG = 3,40]	7.984	.710	126.575	1	.000	6.593	9.374
	[Dependent_LOG = 3,60]	8.825	.727	147.447	1	.000	7.401	10.250
	[Dependent_LOG = 3,80]	9.550	.743	165.072	1	.000	8.093	11.006
	[Dependent_LOG = 4,00]	10.304	.761	183.299	1	.000	8.812	11.795
	[Dependent_LOG = 4,20]	11.167	.781	204.679	1	.000	9.637	12.697
	[Dependent_LOG = 4,40]	12.019	.797	227.272	1	.000	10.456	13.581
	[Dependent_LOG = 4,60]	12.999	.813	255.772	1	.000	11.406	14.592
[Dependent_LOG = 4,80]	14.103	.828	290.036	1	.000**	12.480	15.726	
Location	EE	6.278	.880	50.854	1	.000**	4.552	8.003
	ES	10.506	1.065	97.342	1	.000**	8.419	12.594
	RE	1.684	.409	16.965	1	.000**	.883	2.485

Link function: Logit.

**Statistically significant at the 0.01 level.

*Statistically significant at the 0.05 level.

In the context of the University of Venda, the analysis indicates that the three estimated variables—entrepreneurial support initiatives, entrepreneurship education, and research enterprising—are positive predictors of an entrepreneurial university. Among these, entrepreneurial support demonstrates the highest predictive power, followed by entrepreneurship education, with research enterprising being the least influential of the three variables. The model effectively fulfilled its intended purpose for this study by facilitating the inference of key typologies of indicators that Univen should derive from global best practices to advance its entrepreneurial university agenda.

DISCUSSION OF FINDINGS

Three indicators - entrepreneurship education, entrepreneurial support initiatives, and research enterprising - have emerged as pivotal for advancing the University of Venda's entrepreneurial university agenda.

a. Entrepreneurship Education

Entrepreneurial education comprises several key initiatives, including the development of courses and curricula for knowledge building, awareness programs, and incubation systems for skill development. The critical nature of entrepreneurship courses and curriculum development as a predictor for entrepreneurial universities is well-documented in the literature.⁴⁸ For the University of Venda, adopting such initiatives will be essential for advancing its entrepreneurial agenda. Entrepreneurship

⁴⁸ Lindholm Dahlstrand and Berggren, "Chapter 4 Linking Innovation and Entrepreneurship in Higher Education: A Study of Swedish Schools of Entrepreneurship"; Bellotti et al., "Designing a Course for Stimulating Entrepreneurship in Higher Education through Serious Games"; Hoppe, Westerberg, and Leffler, "Educational Approaches to Entrepreneurship in Higher Education"; Wahidmurni Wahidmurni et al., "Curriculum Development Design of Entrepreneurship Education: A Case Study on Indonesian Higher Education Producing Most Startup Funder," *Journal of Entrepreneurship Education* 22, no. 3 (2019): 1528–2651.

education at the higher learning level is crucial as it fosters a positive entrepreneurial climate, equipping students with both theoretical knowledge and practical skills that are vital for their ventures. This approach not only enhances labour market readiness but also prepares students for the complexities of a competitive, knowledge-based economy in the entrepreneurial world.⁴⁹ Offering entrepreneurship as a compulsory course across various disciplines—rather than limiting it to business schools—ensures that all students gain the necessary skills and knowledge, addressing the limitations of current practices where such courses are confined to specific faculties.⁵⁰

Bergmann et al. advocate for broader entrepreneurship offerings, emphasizing that exposure to the entrepreneurship world increases students' intentions and motivation to start businesses.⁵¹ This view aligns with Durán-Sánchez et al., who argue that entrepreneurship education is critical for fostering entrepreneurial spirit and equipping young people with innovative skills and attitudes.⁵² Restricting such education to a select group deprives other potential entrepreneurs of valuable knowledge; despite these justifications, there is no evidence of South African universities mandating entrepreneurship courses for all students, which limits entrepreneurial skills development. Taatila underscores the necessity for institutions to adapt their pedagogy to include entrepreneurship fundamentals, thereby producing a larger cohort of academically-educated entrepreneurs who can contribute, knowledgeably to the entrepreneurial landscape.⁵³

Similarly, incubation systems play a significant role in entrepreneurial university development, as recognized by Bøllingtoft, Bennett et al., and Sudana et al.⁵⁴ These systems, characterized by expert guidance and multifaceted support activities - such as training, networking, marketing, and resource mobilization - create a conducive environment for entrepreneurial ventures and innovation.⁵⁵ For the University of Venda, located in a resource-rich yet socio-economically challenged region, a robust incubation system is crucial for providing entrepreneurial support to students, staff, and the local community. The Vhembe District, despite its natural resources and agricultural output, faces issues, such as infrastructure deficiencies, poverty, and high unemployment, which further justify the need for an effective incubation system.⁵⁶ Sudana et al. emphasize that incubation systems equip academics with the theoretical and practical knowledge necessary to guide student entrepreneurs and enhance their resilience.⁵⁷ This support extends beyond knowledge acquisition to include nurturing high-potential ideas and spin-off businesses, thus, reinforcing the relevance of incubation systems in fostering a robust entrepreneurial agenda.⁵⁸

Awareness programs also play a pivotal role in stimulating entrepreneurship by providing platforms for gaining insights into entrepreneurial practices. These programs, which include syllabus development, academic debates, conferences, workshops, and seminars, can be delivered through both

⁴⁹ Donna Fernández-Nogueira et al., “The Entrepreneurial University: A Selection of Good Practices,” *Journal of Entrepreneurship Education* 21, no. 3 (2018): 1–17.

⁵⁰ Chanphirun Sam and Peter van der Sijde, “Understanding the Concept of the Entrepreneurial University from the Perspective of Higher Education Models,” *Higher Education* 68, no. 6 (December 28, 2014): 891–908, <https://doi.org/10.1007/s10734-014-9750-0>.

⁵¹ Bergmann et al., “The Climate for Entrepreneurship at Higher Education Institutions.”

⁵² Durán-Sánchez et al., “Mapping of Scientific Coverage on Education for Entrepreneurship in Higher Education.”

⁵³ Taatila, “Learning Entrepreneurship in Higher Education.”

⁵⁴ Anne Bøllingtoft, “The Bottom-up Business Incubator: Leverage to Networking and Cooperation Practices in a Self-Generated, Entrepreneurial-Enabled Environment,” *Technovation* 32, no. 5 (May 2012): 304–15,

<https://doi.org/10.1016/j.technovation.2011.11.005>; Dag Bennett, Diana Pérez-Bustamante Yábar, and José Ramón Saura, “University Incubators May Be Socially Valuable, but How Effective Are They? A Case Study on Business Incubators at Universities,” 2017, 165–77, https://doi.org/10.1007/978-3-319-47949-1_11; Sudana et al., “Business Incubator Training Management Model to Increase Graduate Competency.”

⁵⁵ El-Khasawneh, “Entrepreneurship Promotion at Educational Institutions: A Model Suitable for Emerging Economies.”

⁵⁶ Iwara, “Towards a Model for Successful Enterprises Centred on Entrepreneurs Exogenous and Endogenous Attributes: Case of Vhembe District, South Africa.”

⁵⁷ Sudana et al., “Business Incubator Training Management Model to Increase Graduate Competency.”

⁵⁸ Lindholm Dahlstrand and Berggren, “Chapter 4 Linking Innovation and Entrepreneurship in Higher Education: A Study of Swedish Schools of Entrepreneurship”; Saeid Karimi et al., “Entrepreneurship Education in Iranian Higher Education: The Current State and Challenges,” *European Journal of Scientific Research* 48, no. 1 (2010): 35–50.

online and physical engagements.⁵⁹ They enable networking and interaction among students and community members, thereby igniting entrepreneurial spirit and intentions.⁶⁰ Faculty entrepreneurship officers and academics can coordinate these activities to create an environment conducive to entrepreneurial exploration and development.

b. Entrepreneurial Support Initiative

Entrepreneurial support initiatives were examined through various dimensions, including the provision of seed funding for enterprises, internship and mentorship programs, and the enhancement of entrepreneurship competition platforms. Seed funding is crucial, as research indicates that a lack of financing is a major deterrent for young people, particularly graduates, in considering entrepreneurial activities.⁶¹ This argument is substantiated by recent studies conducted in the University of Venda area, which highlight the urgent need for policy reforms and practical measures to financially motivate students, academics, and community members toward entrepreneurship.⁶² The absence of adequate funding opportunities negatively impacts entrepreneurial-minded students, deterring them from pursuing ventures in the business sector.⁶³ In South Africa, prospective entrepreneurs, particularly young people, face challenges such as insufficient information on financing, barriers to accessing venture capital, stringent security requirements, and difficulties with business standardization and formalization - issues that an entrepreneurial institution like the University of Venda should address within its institutional framework.

In supporting these arguments, many advanced economies not only facilitate mentorship and skills development programs for students but also provide financial backing to entrepreneurial-minded individuals, nurturing their innovative business ideas.⁶⁴ This financial support plays a significant role in generating a robust business climate among young people, as evidenced by successful entrepreneurial ventures in countries such as Canada, China, Sweden, and the USA. These economies have seen significant contributions from young entrepreneurs in terms of wealth creation and job generation.⁶⁵ In line with Bergmann et al., it is evident that the extent to which entrepreneurship support is institutionalized within higher education correlates positively with the building of an entrepreneurial climate among students, influencing the likelihood of graduates engaging in entrepreneurial activities.⁶⁶ Direct mentorship, frequent internship placements, and policies centred around seed funding, therefore, are essential in positioning the University of Venda as a pivotal

⁵⁹ Rahman et al., "Engineering Students towards Entrepreneurship Awareness"; Bellotti et al., "Designing a Course for Stimulating Entrepreneurship in Higher Education through Serious Games"; Sousa et al., "Entrepreneurship Promotion in Higher Education Institutions."

⁶⁰ Sousa et al., "Entrepreneurship Promotion in Higher Education Institutions"; Fernandez-Alles et al., "TTO Characteristics and University Entrepreneurship: A Cluster Analysis."

⁶¹ Rasmussen and Borch, "University Capabilities in Facilitating Entrepreneurship: A Longitudinal Study of Spin-off Ventures at Mid-Range Universities"; Karimi et al., "Entrepreneurship Education in Iranian Higher Education: The Current State and Challenges"; Thobile N Radebe, "The Challenges/Barriers Preventing the South African Youth in Becoming Entrepreneurs: South African Overview"; Chinomona, Popoola, and Popoola, "The Influence of Entrepreneurial Training, Access to Finance, Entrepreneurial Capacity, Entrepreneurial Atmosphere on Youth Entrepreneurship."

⁶² Iwara, "Towards a Model for Successful Enterprises Centred on Entrepreneurs Exogenous and Endogenous Attributes: Case of Vhembe District, South Africa"; Netshilinganedza, "Factors Influencing the Attitudes of Final Year Undergraduate Students towards Entrepreneurship as a Career Option: A Case-Study at the University of Venda in Limpopo Province of South Africa"; Netshandama, Iwara, and Nelwamondo, "Social Entrepreneurship Knowledge Promotion Amongst Students in a Historically Disadvantaged Institution of Higher Learning."

⁶³ Rasmussen and Borch, "University Capabilities in Facilitating Entrepreneurship: A Longitudinal Study of Spin-off Ventures at Mid-Range Universities"; Karimi et al., "Entrepreneurship Education in Iranian Higher Education: The Current State and Challenges."

⁶⁴ Lindholm Dahlstrand and Berggren, "Chapter 4 Linking Innovation and Entrepreneurship in Higher Education: A Study of Swedish Schools of Entrepreneurship"; Van Looy et al., "Entrepreneurial Effectiveness of European Universities: An Empirical Assessment of Antecedents and Trade-Offs"; Boris Urban and Fenosoa Ratsimanetrimanana, "Access to Finance and Entrepreneurial Intention," *Journal of Enterprising Communities: People and Places in the Global Economy* 13, no. 4 (September 2, 2019): 455–71.

⁶⁵ Van Dijk and Mensch, "Entrepreneurship Education in Swedish Compulsory Schools: The Perception and Implementation from an Educator's Viewpoint"; Véronique Rizzi et al., "Designing a Creative Storytelling Workshop to Build Self-Confidence and Trust among Adolescents," *Thinking Skills and Creativity* 38 (2020): 100704, <https://doi.org/10.1016/j.tsc.2020.100704>; L. Fan, *Entrepreneurship and Entrepreneurship Education in China* (KAB Entrepreneurship Education Research Institute of China, 2012); Yue, *Preferential Policies Lure Returnee Entrepreneurs*; Hao Yu and Yunyun Guo, "Generative Artificial Intelligence Empowers Educational Reform: Current Status, Issues, and Prospects," in *Frontiers in Education*, vol. 8 (Frontiers Media SA, 2023), 1183162.

⁶⁶ Bergmann et al., "The Climate for Entrepreneurship at Higher Education Institutions."

institution for initiating successful entrepreneurs, thereby, contributing to South Africa's job creation, community independence, innovative enterprises, and ultimately - economic development.

c. Research Enterprising

Research Enterprise intercepts two pivotal areas: first, the deepening and motivation of solution-driven research in specialized fields, and second, the implementation, commodification, and commercialization of resultant research outputs. This discussion extends beyond Univen's institutional research culture, ethics, approach, and relevance. Addressing these concerns involves critical multifaceted questions: *What type of research is the University conducting? How is this research being conducted? For whom is the research being conducted? What value propositions are being offered both to graduates and the surrounding communities?* Answering these questions is essential for realizing the initiatives associated with Research Enterprising.

To advance and stimulate solution-driven research, engaged scholarship - where academics collaborate with grassroots community members and development agencies - is crucial. Such collaboration inculcates the co-creation of knowledge and a nuanced understanding of the entrepreneurial landscape, directly sourced from community insights. This approach provides a deeper understanding of societal challenges and needs, guiding the development of targeted support strategies to uplift both students and the grassroots communities.⁶⁷ This mindset is essential as universities exist not only for their benefit but also to serve and understand their surrounding communities, which can guide the development of adaptable frameworks for engagement. Contextual and collaborative research lays a robust foundation for achieving an institution's entrepreneurial goals and identifying specific support channels that foster higher success rates. It is imperative, therefore, that the University of Venda - aiming to become a rural-based, community-centric entrepreneurial institution contributing to South Africa's economic development - engages in comprehensive research that unites knowledge holders from grassroots communities with development agencies.

Societal issues and entrepreneurship practices vary contextually, suggesting that a generalised research approach or entrepreneurial model may not yield relevant outcomes for the Vhembe District and South Africa, at large.⁶⁸ It is, hence, vital to evaluate whether the research produced by the Univen is sufficiently relevant to be commodified and commercialized for wealth creation. Engaging with grassroots stakeholders enables a detailed and context-specific examination of initiatives that address local issues, enhancing the relevance, usability, and applicability of research outcomes. Additionally, the relevance and quality of research significantly will influence the University's ability to patent, license, and commercialize intellectual property, as well as to establish spin-offs from faculty, staff, and student research activities. Transitioning to an entrepreneurial university, thus, requires a paradigm shift from traditional, generalized research to more applied, robust, relevant and solution-oriented research that actively engages with and responds to societal needs.

RECOMMENDATIONS

Based on the findings and discussion, the following recommendations have been made:

- Prioritizing investments in indicators with higher potential for success, such as entrepreneurial support initiatives, which demonstrate the greatest predictive power.
- Conduct further studies to explore the underlying narratives that shape participants' perceptions of each variable to gain deeper insights into their choices.
- Investigating why research enterprise, as an indicator, has the lowest predictive power to enable an understanding and remedying of these limitations.

⁶⁷ Durán-Sánchez et al., "Mapping of Scientific Coverage on Education for Entrepreneurship in Higher Education"; Iwara, "Towards a Model for Successful Enterprises Centred on Entrepreneurs Exogenous and Endogenous Attributes: Case of Vhembe District, South Africa"; Ndlovu et al., "Contextualising Entrepreneurship as a Panacea to Youth Unemployment in South Africa."

⁶⁸ von Graevenitz, Harhoff, and Weber, "The Effects of Entrepreneurship Education"; Iwara, "Towards a Model for Successful Enterprises Centred on Entrepreneurs Exogenous and Endogenous Attributes: Case of Vhembe District, South Africa."

CONCLUSION

In conclusion, the study identified the key indicators that enable entrepreneurial-centred institutions of higher learning to excel in their transformation aspiration. By examining global strategies for entrepreneurial universities, several key initiatives emerged, which can be categorized into three main domains: entrepreneurship education, entrepreneurial support initiatives, and research enterprise. Firstly, there is a strong emphasis on the need for the institution to redefine its pedagogy to incorporate and centralize entrepreneurship education. This approach is anticipated will significantly increase the number of academically-educated entrepreneurs, thereby generating innovative approaches to entrepreneurship within societies. Essential components of this strategy include prioritising entrepreneurship as a compulsory module, implementing awareness programs, and establishing well-equipped incubation platform centres or programmes. Secondly, there is a need to shift focus to building an institutional framework designed to nurture, motivate, and finance students' innovative ideas. Key elements of this framework include creating competition platforms for entrepreneurial engagement and expanding internship and mentorship programs that facilitate practical-skills development, through placements in functional enterprises. Lastly, there is a critical need to transition from traditional, generalized research to a more applied, context-specific, robust, community-engaged, and solution-driven research paradigm. This shift is expected to enhance both the relevance and quality of research outputs, thereby enabling universities to generate intellectual property, patents, and licenses, and create commercial spin-offs from the research activities of faculty, staff, and students. Overall, these strategies will enable any entrepreneurial-intended institution of higher learning, including the University of Venda, to better serve its communities, generate internal wealth, and contribute to the development of graduate entrepreneurs, thereby supporting the country's diversification of strategies for economic growth.

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