United Nations
Economic Commission for Africa

ADVANCING ENTREPRENEURIAL UNIVERSITIES
IN AFRICA

ETHIOPIA, GHANA AND SOUTH AFRICA

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Preface

The former President of South Africa, Nelson Mandela, stated: "The power of education extends beyond the development of skills we need for economic success. It can contribute to nation-building and reconciliation." Universities are thus expected to impart the skills needed to meet the economic, social and environmental needs of society through their teaching, research and societal contribution. The teaching and research missions of a university are important, especially in a continent where the population is young and growing rapidly. Demand for higher education is likely to remain high. The research mission is important in generating the knowledge that advances the teaching mission at all levels (undergraduate and postgraduate programmes) and in transmitting new knowledge that reshapes society.

The increased focus on universities to generate knowledge of economic relevance led to the rise of the third mission of universities, termed the "entrepreneurial mission". The term "entrepreneurial university" largely refers to a university's focus on capitalizing on its massive research outputs and talent, and/or its exhibition of practices that mirror those of the private sector (e.g., the existence of technology transfer offices, intellectual property management units, incubation and enterprise development centres). However, the concept has evolved beyond contributions to economic success. Universities are expected to contribute directly and indirectly to solving social and environmental challenges and to creating or capturing opportunities.

The framework used in the research undertaken for the present study takes all of the above-mentioned issues into consideration, as well as the fact that there are unique opportunities in Africa compared with the rest of the world. Currently, a child in Africa has a 6–8 per cent chance of getting into a university compared with 80 per cent for a child in a more developed country. New universities are being built in Africa to meet the demand for university education. Such institutions can be designed to be entrepreneurial in nature from the start, which presents a great opportunity for reforming future higher education and the education sector, in general.

Second, while most of the world debates and sometimes resists the need to encourage universities to embrace the entrepreneurial mission for fear of its impact on academic freedom, in Africa, the entrepreneurial mission is embraced for two main reasons: high unemployment among young people and the resource constraints faced by universities. Countries and universities are seeking ways to empower their students to become more entrepreneurial in order to create employment for themselves and others, and to encourage research units to become semi-autonomous and self-sustaining to relieve the pressure on university budgets. Finally, the demand for entrepreneurial talent is expected to rise as African firms become more knowledge-driven, and digitalization and manufacturing take hold.

The research was intended to shed light on the importance of the role universities can play in solving local, regional, national and global challenges, and in contributing to environmental sustainability and social development. For instance, universities should take the lead in ensuring that Africa is able to meet its targets on climate change, gender equality and advancing freedom to enable individuals to shape their own futures.

The present report contains a research methodology that countries can use to assess their universities. It also provides the outcome of research findings using the framework for selected universities in Ethiopia, Ghana and South Africa. The research results for Algeria will be presented separately. While the sample size, in terms of the number of countries and the

number of universities per country in the study, is small, the data provide clear messages in areas that need attention and in which Africa is doing well, thereby informing further development.

Acknowledgements

The views expressed in the present report do not necessarily reflect the views of ECA, the United Nations, its senior officials or any of its Member States.

PART I: TOWARDS AN ASSESSMENT GUIDE FOR ENTREPRENEURIAL UNIVERSITIES

CHAPTER 1. CONTEXT, FRAMEWORK AND SYNTHESIS OF FINDINGS AND OBSERVATIONS

Executive summary

Universities have been increasingly expected to transcend their conventional teaching and research missions[1] to incorporate a third mission, which emphasizes enhanced external engagement and direct contributions to the socioeconomic development of their localities. The third mission expands the active role of the university as a catalyst for entrepreneurship and thus for the socioeconomic development of countries, thereby paving the way for the development of entrepreneurial universities. In an entrepreneurial university, the three missions will complement one another to realize the entrepreneurial strategy and establish entrepreneurship as a key competence of the institution. The present report is aimed at enriching the understanding of the status of development of entrepreneurial universities in Africa.

A survey was administered to collect data from respondents in selected universities in four African countries: Algeria, Ethiopia, Ghana and South Africa. A structured questionnaire was used for data collection; the questionnaire adopts the seven broad areas defined in the publication of the Organisation for Economic Co-operation and Development and the European Commission entitled *A Guiding Framework for Entrepreneurial Universities*, but the measurement items have been revised for each of the areas to account for new issues and knowledge of the topic. The seven broad areas assessed are: leadership and governance; organizational capacity, people and incentives; entrepreneurial development in teaching and learning; pathways for entrepreneurs; business/external relationships for knowledge exchange; the entrepreneurial university as an international organization; and impact measurement.

A synthesized analysis of the survey results of Ethiopia and Ghana appear in Part I, while the individual national-level analyses and findings of three countries – Ethiopia, Ghana and South Africa – appear in Part II. The key issues observed are highlighted and discussed, on the basis of which the implications for policy and institutional practice of universities are presented.

Key findings

The synthesized analysis of the survey results for Ethiopia and Ghana indicates the following key observations:

(1) Overall, the scores of Ghana in all seven dimensions were higher than those of Ethiopia. However, both countries exhibited an identical pattern. For instance, the three areas that recorded the highest mean scores in both countries were the entrepreneurial university as an international organization (internationalization), business/external relationships for knowledge exchange, and leadership and governance (in descending order). The areas that scored the lowest in both countries were organizational capacity, people and incentives, and impact measurement. This suggests that the areas that the respondents in the two countries found to be inadequate and adequate, respectively, were consistent at the country level.

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[1] The so-called first (teaching) and second (research) missions of universities.

(2)   A core aspect of entrepreneurial universities is a shared vision and understanding. In both countries, respondents from disciplines in the humanities and social sciences generally scored all dimensions more positively than respondents from disciplines related to science, technology, engineering and mathematics. This may be because the high risks associated with commercializing research and development outputs related to those subjects often require more investments in funding, time and personnel than those of other disciplines, or because entrepreneurship is a social sciences discipline and thus may be perceived differently.

(3)   In terms of roles, respondents in leadership positions were generally more positive than those in teaching and research positions in Ethiopia. In Ghana, the differences in terms of positions were very small and may be a result of the sampling strategy employed (see the case of Ghana for details). This is perhaps expected given the likelihood of information asymmetry between the two groups.

(4)   The elements of the dimensions that demonstrate the existence of support for entrepreneurial initiatives and activities at a university were largely rated more poorly in many cases. Relatively poor scores were given to areas such as: the commercialization of outputs; technology transfer and intellectual property rights; facilitating access to the private sector; support for business start-ups and academic spin-offs; entrepreneurship training for staff across the university; and entrepreneurial measures targeting female entrepreneurs.

(5)   It was observed that several universities were empowering their communities, surrounding areas and countries, and contributing to relevant global efforts. These included providing improved agricultural practices to the communities in which the university was located, and training maritime engineers for the global shipping industry. Universities that had established units and mechanisms for interacting with external partners and communities fared better than those that had not.

Recommendations

(1)   Recognizing that the areas of internationalization and external knowledge exchange received the highest rating in both countries, it is necessary to establish a clearer system for external parties to exploit the intellectual property of universities in both countries, and to better link internationalization with entrepreneurial strategy, in Ethiopia in particular.

(2)   As organizational capacity, people and incentives, and impact measurement scored poorly in both countries, efforts to include entrepreneurial activities in the performance appraisal of staff could send a clear signal that the leadership and management wish to transform the university's entrepreneurial outlook. There may also be a need to review resource allocation in relation to support for related initiatives and activities. Similarly, universities should develop frameworks to assess the impact of their entrepreneurial activities and measures.

(3)   Finally, both Governments and their agencies and universities need to ensure that university departments and schools have the autonomy to act on entrepreneurial opportunities when they arise. A significant level of policy overlap and overregulation discourages staff, students, partners and communities from

exploiting entrepreneurial opportunities. Clearer guidelines and independent technology transfer and enterprise development units could help.

1.   Introduction

1.1   Background

Universities have been increasingly expected to transcend their conventional teaching and research missions[2] to incorporate a third mission, which emphasizes enhanced external engagement and direct contributions to the socioeconomic development of their localities (Compagnucci and Spigarelli, 2020; Etzkowitz and others, 2000; Perkmann and others, 2013). This expansion of the university mission has partly occurred in response to changes in the economic importance of knowledge. Economies have evolved from being driven by physical capital, to being driven by knowledge capital to being driven by entrepreneurship and innovation, positioning universities as major catalysts of growth in national strategies worldwide. The role of universities as a seedbed, as well as a hub, of entrepreneurial capital and innovation in society are well articulated (Audretsch, 2014; Guerrero, Cunningham and Urbano, 2015).

Other drivers, including mounting pressures from decreased public funding and market competition, further require universities to enhance the applicability, relevance, transfer and commercialization of the knowledge that they generate, as strategies to put knowledge into practical use and to diversify their own funding base (Davies, 2001; Duruflé, Hellmann and Wilson, 2018; Etzkowitz, 2016; Gibb, Haskins and Robertson, 2013).

The "entrepreneurial university" model in this context is seen as a natural and necessary step in the evolution of a university system, ensuring that the university remains relevant, adaptative, competitive and, most importantly, an entrepreneurial actor connected with other agents (e.g., in the public, private and non-profit sectors) in the development and transformation of societies (Clark, 1998; Subotsky, 1999; Etzkowitz and others, 2000; Rothaermel, Agung and Jiang, 2007; Sánchez-Barrioluengo and Benneworth, 2019).

In spite of extensive discussions about entrepreneurial universities and some widely recognized leading examples (e.g., Massachusetts Institute of Technology and Stanford University), there is no one-size-fits-all formula or best approach for creating entrepreneurial universities. Universities must decide on and pursue their own pathways, strategies and activities to drive and realize the transformation (Clark, 1998; Perkmann and others, 2013; Sánchez-Barrioluengo, Uyarra and Kitagawa, 2019). Such a transformation will not happen overnight, as Clark (2001, p. 17) stressed: "[the creation of an entrepreneurial university] is likely to happen not as a big bang, but in an incremental, evolutionary fashion, as a flexible organizational character that can adjust and readjust with better responses to rapidly changing demands".

Indeed, the rise of entrepreneurial universities and the associated changes have been shown to occur in waves of development (Dalmarco, Hulsink and Blois, 2018; Duruflé, Hellmann and Wilson, 2018), starting with an initial focus on creating technology transfer offices to now covering a broad range of configurations, services and activities, such as entrepreneurship education, academic entrepreneurship, knowledge transfer, academic engagement and knowledge exchange activities in the university system (Compagnucci and Spigarelli, 2020; Pugh and others, 2018). In sum, different trajectories could be pursued and "[the entrepreneurial paradigm] can be enacted at teaching as well as research universities" (Etzkowitz and others, 2000, p. 314).

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[2] The so-called first (teaching) and second (research) missions of universities.

Despite the heterogeneity of entrepreneurial universities, some common parameters and structural mechanisms are deemed to be important in a university's "organizational DNA" in order for it to foster and sustain its entrepreneurial transformation (Clark, 2001; Pinheiro and Stensaker, 2014; Markuerkiaga, Errasti and Igartua, 2014). Initiating the discussion of entrepreneurship in higher education as early as 2001, the Organisation for Economic Co-operation and Development (OECD), in conjunction with the European Commission, published a framework in which seven areas are highlighted: leadership and governance; organizational capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university. They are considered to be the key characteristics of the entrepreneurial university (OECD and European Commission, 2012).

Subsequent studies have continued to enrich the understanding of the characteristics and factors that could be important to the creation of entrepreneurial universities. Guerrero and Urbano (2012), for example, discussed the importance of factors in terms of the formal (e.g., organizational and governance structure, support measures) and informal (e.g., community attitudes, teaching methodologies, reward system), the environment, resources and capabilities (e.g., networks and alliances). A framework developed by Gibb, Haskins and Robertson (2013) highlights 10 areas in the organizational design that are relevant to creating authentic entrepreneurial university leadership.

Etzkowitz (2016, p.84) also suggested that the confluence of the following five elements is required to make a fully fledged entrepreneurial university: "(1) the organization of group research; (2) the creation of a research base with commercial potential; (3) the development of organizational mechanisms to move research out of the university as protected intellectual property; (4) the capacity to organize firms within the university; and (5) the integration of academic and business elements into new formats such as university-industry research centres". These parameters, however, are neither intended for benchmarking nor adequate for it, and indicate that there are certain generic areas on which universities should focus in order to assess their current conditions and identify potential areas for action in the entrepreneurial transformation process.

1.2 The focus and aim of the report

The focus of the present report is on the development of entrepreneurial universities in Africa, of which understanding is limited and relevant research lags far behind that conducted in other regions, in particular Europe, North America and Asia (Compagnucci and Spigarelli, 2020; Centobelli and others, 2019). However, it is Africa that holds the greatest opportunities for advancing the entrepreneurial mission of higher education institutions, especially universities.

First, the higher education system in Africa is expanding at a very rapid rate, as is reflected in the increasing number of public and private universities, the expansion of existing universities and the multiplication of the online educational services offered by both new and existing universities (Lebeau and Oanda, 2020). As of 2020, Africa had 1,225 recognized higher education institutions in the uniRank database,[3] of which 586 were public and 601 were private. While concerns over the quality of higher education remain, the demand for higher education in Africa is likely to be high given the continent's rapidly growing population, which is increasingly educated and wealthier than before. This trend presents Africa with the

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[3] Of the 1,225, 38 universities were not classified. For more information on uniRank, see: www.4icu.org/Africa/.

opportunity to design and develop new sets of universities that are entrepreneurial from the outset.

Second, Africa has a young population, which is a major asset if that population is appropriately empowered with the needed skills. In a world that is ageing, a skilled and talented young population is likely to be in high demand. Estimates suggest that, by 2034, the African workforce will be about 1.1 billion out of an estimated total population of 1.8 billion (Bughin and others, 2016). By that time, about 64 per cent of the African population will be under the age of 30. A younger population is likely to drive demand for higher education but is also likely to be more innovative and entrepreneurial in nature. Universities, as the main beneficiaries of this trend in the foreseeable future, need to be at the forefront of empowering and supporting this young population to drive innovation and entrepreneurship.

Third, the high youth unemployment rate in Africa is unlikely to be resolved quickly and easily given the young and rapidly expanding population. Unemployment among young people also afflicts university graduates, some of whom are underemployed or poorly remunerated, or remain unemployed for several years. The pressure on universities to provide an educational experience that inspires and empowers students and the community at large to be entrepreneurial will inevitably grow. Universities in Africa need to position themselves to become entrepreneurial in nature.

Fourth, in general, the African research and development system is at the stage of development at which the higher education and public sectors are the main stakeholders in research and development. In *African Innovation Outlook III* (African Union Development Agency, 2019), it is estimated that the higher education sector accounted for 74 per cent of research and development expenditure by performance in Ethiopia, compared with 60 per cent in Egypt, 51 per cent in Botswana and 46 per cent in Uganda, while South Africa was the only country in which industry accounted for 46 per cent of research and development expenditure by performance. In other words, a significant proportion of the national research and development expenditure supported research in universities. As a result, empowering universities to develop clear pathways to bring their research outputs to the market is perhaps more important in Africa than in industrialized countries, in which most of the research and development is funded and carried out in industry.

Fifth, the increased demand for knowledge has placed universities at the centre of national innovation systems. Like most developing countries, the most educated and best trained people in new and emerging technologies are at universities and other public research institutions, while the entrepreneurial talent is in the business sector, where there are no in-house research and development units. As such technologies as artificial intelligence, blockchain, nanotechnology, gene editing and advanced energy technologies become essential to the competitiveness of countries and businesses, universities are becoming even more important drivers of innovation than before.

Finally, universities and other public research institutions are important partners in finding solutions to global and national challenges that may not be profitable or attractive to private investors at a given point in time. Coronavirus disease (COVID-19) shone a spotlight on the importance of university research. Globally, large and small universities alike became a lifeline for information and testing, as well as in providing innovative treatments, personal protective equipment and testing services for COVID-19. The best-known resources, such as the John Hopkins University database, provided more detailed information on national COVID-19 trends globally and daily, and efforts such as the Oxford University vaccine, produced by AstraZeneca, are the norm rather than an exception. From testing kits and

ventilators in Kenya, Senegal and Zimbabwe, to robots in Rwanda and Tunisia and modelling of the spread of COVID-19 in South Africa and Zambia, African university research was in the limelight and its full potential to address some of the continent's major challenges and bring solutions to the market was revealed (Mulenga and others, 2021). Reshaping universities to become entrepreneurial could help Africa to address major challenges, such as those posed by climate change, unemployment, health and hunger.

1.3   Research approach and methodology

There is no unified definition of "entrepreneurial universities" (Markuerkiaga, Errasti and Igartua, 2014; Pugh and others, 2018). The present report adopts the broad concept of entrepreneurial universities as those that "[envision] an academic structure and function that is revised through the alignment of economic development with research and teaching as academic missions", as presented in Etzkowitz and others (2000, p. 314). This concept articulates the common vision of entrepreneurial universities, in general, regardless of the diverse characteristics, inputs, activities and/or pathways that may be exhibited and adopted.

1.3.1 Data collection instrument and analysis

A survey on universities was administered to collect primary data, from which general insights into the state of development of entrepreneurial universities in Africa could be derived. The main design of the survey instrument – a questionnaire – was adapted from the Guiding Framework for Entrepreneurial Universities developed and launched by OECD in 2012 in conjunction with the European Commission (OECD and European Commission, 2012). It was found that the seven broad areas covered in the Guiding Framework adequately synthesized and encompassed most of the key parameters that were central to the creation of entrepreneurial universities, as specified in the extant literature. These seven broad areas are: leadership and governance; organizational capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university (see table 1.1).

Table 1.1
Description of the seven areas in the Guiding Framework for Entrepreneurial Universities

1.	Leadership and governance	Leadership and governance configurations and strategic priorities to strengthen the entrepreneurial agenda.
2.	Organizational capacity, people and incentives	Organizational structures and approaches, including financing strategy, resource allocation, recruitment and staff development, and performance appraisal and incentives.
3.	Entrepreneurship development in teaching and learning	Approaches and initiatives in entrepreneurial learning and teaching, as well as entrepreneurship training, involving internal and external participants.
4.	Pathways for entrepreneurs	Support for "intrapreneurs" (staff and students) in their career development or for enterprising individuals in becoming entrepreneurs.
5.	University-business/external relationships for knowledge exchange	Initiatives and activities to promote knowledge exchange with external non-academic stakeholders.

6.	The entrepreneurial university as an internationalized institution	Initiatives and programmes that promote internationalization, in terms of teaching, research, talent development, new opportunities and the culture of the university.
7.	Measuring the impact of the entrepreneurial university	Major areas of impact commonly expected from the roles and activities of the entrepreneurial universities to be measured.

Source: Adapted from OECD and European Commission (2012).

While the seven broad areas of the Guiding Framework for Entrepreneurial Universities were adapted to organize the survey, substantial revisions and additions were made to the survey instrument.

First, the statements for measuring each of the seven areas originally included in the documentation of the Guiding Framework were revised and expanded in order to enable a more thorough and enriched assessment to be conducted. The findings of ongoing research on the topic, as well as timely themes about entrepreneurship and socioeconomic development, including female entrepreneurship and sustainable development, were considered when making the revisions and additions. Such revisions and additions are deemed essential to capturing not only the heterogeneity but also the evolution of entrepreneurial universities, with particular attention paid to the context of Africa. This ensures that the findings are relevant and current.

In this section, the respondents were asked to rate each of the statements categorized in the seven areas on a seven-point Likert scale, from "0 – Fully disagree" to "6 – Fully agree" based on the guide provided, as depicted in table 1.2.

Table 1.2
Explanation of the seven-point Likert scale measures

0	Fully disagree	The attribute does not apply at all or the measure has not even been discussed.
1	Strongly disagree	Some general discussions have taken place, but no specific measure is defined and no practical step is undertaken
2	Disagree	Measures have been discussed and broadly defined but are not adopted or practised.
3	Neutral	Measures are in place but only minimal implementation has taken place.
4	Agree	Measures are applied with some good degree of success of which you are proud.
5	Strongly agree	Measures applied widely, for example, across the university and also with external linkages, yielding good results.
6	Fully agree	The university can be deemed a good practice or example of an entrepreneurial university. Measures are fully integrated across all faculties; they are well known by all and/or very successful. There is significant engagement and linkage of and recognition by external stakeholders

To simplify the analysis, it is assumed that the development of the areas specified in the individual statements under each of the seven areas is adequate if the respondents reported 4 (agree), 5 (strongly agree) or 6 (fully agree). On the other hand, the development of areas specified in the statements is deemed inadequate if the respondents reported 0 (fully disagree), 1 (strongly disagree) or 2 (disagree). For those areas that were reported to be 3 (neutral), it is presented as a category distinct from either adequate or inadequate, as respondents may either have no knowledge of them or do not have any clear opinion about their development. Applying the seven-point Likert scale, the mean score was used to analyse and interpret the data. A mean

score of under 3 implies that the majority of respondents tended to disagree (at level 0 to 2) with the statements; with a mean score above 3, the majority of respondents tended to agree with the statement. The highest mean score therefore indicates that the area in question was considered more adequate than the others.

Second, in a separate section on the questionnaire, respondents were asked to explicitly indicate, based on a pre-defined list of items derived from the existing literature, whether or not their universities have:

- Relevant strategies included in the mission statement

- A clear implementation plan published for these strategies

- Specific structural designs, facilities, and entrepreneurship education and outreach programmes that the existing literature deem to be supportive and indicative of the entrepreneurial transformation

For the entire section, respondents were asked to choose "Yes", "No" or "Not sure" for each of the pre-defined items. The findings in the present section provide supplementary evidence to support and verify the perceptual statements in the first section.

Third, items to understand the funding issues in relation to the entrepreneurial transformation of the university are included as a specific part in the questionnaire. Respondents were asked whether or not: 1) there was a budget allocated for a list of activities relevant to the seven broad areas; and 2) specific sources of funding for implementing the entrepreneurial strategy have grown in the past three years. Responses include: "Yes, it has grown"; "No, it has not grown"; "No separate budget allocated" (for 1),"No funding from this source at all" (for 2); and "No information/Not sure".

Fourth, open-ended questions are included in different sections to capture additional comments and information that the respondents could or wish to provide to enrich the primary data collected.

The questionnaire was sent to a sample of experts in Africa (four) and Europe (two) for review and comments in order to ensure that questions are relevant and consistent, that the coverage was adequate to capture the required data for addressing the topic; and that the questions are clearly worded, easy to understand and able to be addressed by the respondents. The questionnaire was finalized after two arounds of refinement, and developed into an electronic Google forms.

Answers to all of the questions were required as default in the online version (Google forms) of the questionnaire for this survey, ensuring that the returned questionnaires provided complete information for analysis. The questionnaire is included in the annex.

1.3.2 Empirical locations

The survey was conducted in four countries: Algeria, Ethiopia, Ghana and South Africa. The countries were deliberately chosen. They are from different regions of Africa: Algeria (north); Ethiopia (east); Ghana (west); and South Africa (south). They also share some similarities and differences in their economic, business and social aspects, as shown in table 1.3.

Table 1.3
Descriptive data of the four survey locations

	Algeria	*Ethiopia*	*Ghana*	*South Africa*
Gross national income per capita, (current US$) (World Bank, 2019)	Lower Middle Income[4] ($4,010)	Low Income ($850)	Lower Middle Income ($2,220)	Upper Middle Income ($6,040)
Percentage of young people not in employment, education or training (World Bank)	21.0 (2017)	10.5 (2013)	30.5 (2017)	32.5 (2019)
Tertiary school enrolment (gross percentage) (United Nations Educational, Scientific and Cultural Organization)	51 (2018)	8 (2014)	17 (2019)	24 (2018)
Tertiary school enrolment (gross percentage) (United Nations Educational, Scientific and Cultural Organization)	64.42 (2018)	5.26 (2014)	15.78 (2019)	28.31 (2018)
Entrepreneurial culture (0–100) (World Competitiveness Report, 2019)	43.5	39.8	51.1	56.4
Entrepreneurship Education at School Stage (score 1–5, 1 being highly insufficient and 5 being highly sufficient) (Global Entrepreneurship Monitor)	2.45 (2013)	2.38 (2013)	2.08 (2013)	1.70 (2019)
Total early-staged entrepreneurial activities (percentage of population aged 18–64) (Global Entrepreneurship Monitor)	4.89 (2013)	14.73 (2012)	25.82 (2013)	10.77 (2019)
Entrepreneurial intentions rate (percentage of population aged 18–64) (Global Entrepreneurship Monitor)	36.02 (2013)	23.84 (2012)	46.50 (2013)	11.90 (2019)
Global Innovation Index (score 0–100) (World Intellectual Property Organization, 2020)	19.48	18.06	22.28	32.67
Commercialization (score 0–100) (World Competitiveness Report, 2019)	46.4	31.8	40.3	57.1
Ease of doing business (ranking 1–190) (World Bank, 2020)	157	159	118	84

Source: Author, based on data from the following websites:
https://data.worldbank.org/indicator/NY.GDP.PCAP.CD
https://data.worldbank.org/indicator/SE.TER.ENRR?locations=AF-AU,
https://www.weforum.org/reports/how-to-end-a-decade-of-lost-productivity-growth,
https://www.wipo.int/publications/en/details.jsp?id=4526&plang=EN,
https://openknowledge.worldbank.org/bitstream/handle/10986/32436/9781464814402.pdf.

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[4] World Bank definitions of: low-income countries (<$1,036); lower-middle-income ($1,036–$4,045); upper-middle-income ($4,046–$12,535); and high-income (>$12,535). See: https://blogs.worldbank.org/opendata/new-world-bank-country-classifications-income-level-2020-2021.

1.3.3 Data collection and respondents

In each of the four countries, the survey was coordinated and overseen by an expert consultant in the country who had knowledge of the higher education sector. The consultants were requested to sample a range of universities in the country and to survey multiple respondents in different positions and faculties in each of the universities sampled, which helped to provide a relatively broad view of the state of development of entrepreneurial universities in the country and to enable a certain level of data triangulation. The sampling and data collection designs for each country can be found in the respective national reports.

In general, data were collected using the original questionnaire designed in English, except in Algeria, where the questionnaire was translated into French.

The synthesis analysis presented in Part I of the report includes data from Ethiopia and Ghana only. The findings for Ethiopia, Ghana and South Africa are presented in individual chapters in Part II of the report. Data collection in Algeria is ongoing and the findings will therefore be presented in forthcoming publications.

1.4   Organization of the report

Following the introduction, the second section provides additional information on the concept and attributes of entrepreneurial universities, specifically on their missions and roles, scope of activities, and key institutional mechanisms central to effecting their transformation. This justifies the importance of the seven broad areas highlighted in the Guiding Framework, which underpin the national survey. The third section contains a synthesis of the findings of the survey results of Ethiopia and Ghana, which is followed by a discussion of key findings in the fourth section. Part I of the report concludes with the implications for policies and universities in relation to the promotion and acceleration of the development of entrepreneurial universities in Africa. Part II of the report contains the national findings for Ethiopia, Ghana and South Africa in individual chapters.

2.   Entrepreneurial universities

The section on entrepreneurial activities contains key background information about the entrepreneurial university to support the subsequent analysis and discussion of the national survey results. It explains why the concept of the entrepreneurial university emerged and what the driving forces are; what roles and activities entrepreneurial universities are expected to play and undertake to differentiate them from traditional universities; and which essential institutional attributes and features they should have to enact the entrepreneurial transformation. The section ends with an explanation of the Guiding Framework for Entrepreneurial Universities, which synthesizes seven key areas to help to assess the state of the development of entrepreneurial universities and the required conditions.

2.1   The emergence of entrepreneurial universities and driving forces

"Change is not the first thing that comes to mind when thinking of universities" (Duruflé, Hellmann and Wilson, 2018, p. 615). The emergence of entrepreneurial universities has been driven by significant and changing societal needs, which are triggered by diverse forces in the external macro and (higher education) sectoral environment, as well as in the internal organizational environment of universities (Altmann and Ebersberger, 2013; Gibb, Haskins and Robertson, 2013). Specifically, "entrepreneurial activities [in universities] are undertaken with the objective of improving regional or national economic performance as well as the university's financial advantage and that of its faculty" (Etzkowitz and others, 2000, p. 313). In this regard, the positioning and transformation of universities worldwide to become

"entrepreneurial" is seen as a necessary response to the following three common pressures (Etzkowitz, 2016; Compagnucci and Spigarelli, 2020):

- Funding stringency and the consequent change in policies and practices related to public funding, the largest source of university revenue in most countries, which have increasingly tied funding allocation to universities' direct value creation and contributions to national and regional development needs (i.e., their societal impact) (Abreu and Grinevich, 2013).

- The knowledge-based economy, in which knowledge and innovation are emphasized as engines of the socioeconomic development of societies, and entrepreneurs are emphasized as a main means of materializing the market value of innovation (Guerrero and Urbano, 2012). Accordingly, significant changes have been brought about in enterprise policy and labour market demands and, as a result, in the employability attributes, knowledge and skills required to promote and sustain the knowledge-based economy (Sam and van der Sijde, 2014). Recognition of knowledge as the driver of growth positions universities – a major producer and diffuser of knowledge – as a vital contributor to economic development.

- Globalization and, consequently, the internationalization of the higher education sector, lead to increased competition (for students, staff and other resources) among universities. This has intensified the need for universities to become more relevant, adaptative and productive through "the adoption of market-type instruments" (Pinheiro and Stensaker, 2014, p. 501) in terms of, for example, curriculum design and delivery, the recruitment of both staff and students, and international linkages and partnerships so as to better meet the expectations of students and other stakeholders in order to stay competitive.

In the face of these pressures, universities could no longer remain "isolated" and "indirect" contributors to societal development, merely serving as higher education centres for learning and teaching (i.e., the first mission: teaching) and/or as producers of knowledge (i.e., the second mission: research). Universities must demonstrate that the teaching delivered and the knowledge produced are relevant, useful and efficient in improving the socioeconomic well-being of their localities and even wider societies (Audretsch, 2014). In a way, universities have to partly justify the economic costs of the skills and knowledge produced and take measures to minimize any knowledge filter.[5]

Furthermore, universities are expected to directly connect and engage with other institutional entities, including industry and the government, as illustrated in the Triple Helix Model (Etzkowitz and Leydesdorff, 2000; Etzkowitz and others, 2000) and entrepreneurship systems (Lehmann and others, 2020), in generating, transferring and exploiting knowledge and innovation to create measurable impacts. The expectation that universities should serve as integral agents, and even anchor organizations, in mobilizing and deploying the knowledge they produce in order to foster national and regional economic growth, has stimulated third-mission activities alongside conventional teaching and research activities.

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[5] Audretsch (2014) defines a knowledge filter as "the barrier or gap between the investment in new knowledge and its commercialisation" (pp. 316 and 317).

In such a context, the so-called third mission[6] has increasingly become "a guiding and integral principle of the organization and practice of universities and not just a separate strand of activities" in many universities (Sánchez-Barrioluengo, Uyarra and Kitagawa, 2019, p. 472). Altmann and Ebersberger (2013) suggested that the pursuit of the third mission paves the way for the development of entrepreneurial universities. This is because its impact could only be created and demonstrated with universities that directly take part in commercialization and engagement activities related to the research and knowledge they produce; and that incorporate and deliver curricula and training to nurture and instil entrepreneurial capital, including entrepreneurs who could create entrepreneurial opportunities and exploit innovations to generate market value.

In sum, the concept of entrepreneurial universities continues to evolve. It not only goes beyond advancing the entrepreneurial activities of the university community and its partners but can also include addressing social challenges, hosting external partners, providing prototyping and testing services for external parties and informal contacts, and offering advice, among other things. The three missions (i.e., the teaching, research and entrepreneurial missions) complement one another and are fulfilled simultaneously. The entrepreneurial strategy is at the heart of the university system, with entrepreneurship fostered and established as a core competence of the university itself. This understanding is visualized in figure 1.1, and is aligned with the notion that "the emergence of the entrepreneurial university gave universities a dual mandate – to produce new knowledge but also to alter its activities and values in such a way as to facilitate the transfer of technology and knowledge spillovers" (Audretsch, 2014, p. 314).

Figure 1.1
Three missions in entrepreneurial universities
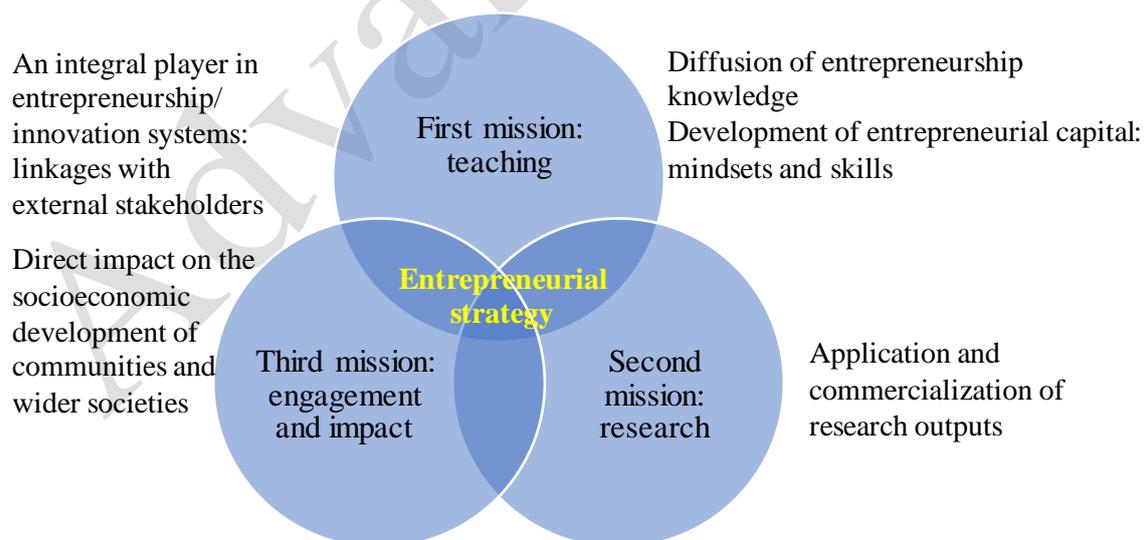
Source: Author.

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[6] There is no unified definition of the third mission. Compagnucci and Spigarelli (2020) referred to the third mission as "an extensive array of activities performed by higher education institutions which seek to transfer knowledge to society in general and to organizations, as well as to promote entrepreneurial skills, innovation, social welfare and the formation of human capital".

2.2 Heterogeneity of the roles and activities of entrepreneurial universities

Universities differ in traditions, types, resource endowments and stages of development, and they are also embedded in different institutional contexts. It is therefore natural that they follow differentiated development paths and strategies in delivering their teaching, research and entrepreneurial missions (Clark, 1998). In this regard, the roles and activities chosen by universities to position themselves as "entrepreneurial" introduce new practices, lead to the transformation of relationships and open new sources of income that are needed to achieve the third mission, and they vary from one university to another. There is hardly a uniform or typical way of adopting and replicating entrepreneurial activities. Nonetheless, the scope of roles and activities mentioned in the extant literature and actual case studies is much broader than technology transfer and licensing, which are commonly seen as the earliest entrepreneurial activities pioneered by universities in the United States of America (Etzkowitz, 1983; Siegel and Wright, 2015; Compagnucci and Spigarelli, 2020). The initial roles and activities in technology transfer and licensing are the forms of entrepreneurial activities that are most widely adopted by universities around the world. The array of roles and activities of entrepreneurial universities could span teaching, research, knowledge exchange, start-up support, business incubation and/or the university's various linkages with different stakeholders and engagement with society, for example, through science parks, shared product development and testing facilities with industry or government units (Siegel and Wright, 2015; Compagnucci and Spigarelli, 2020).

Taking stock of the themes in the literature on entrepreneurial universities, Pugh and others (2018) specified a list of key activities. The list, as shown in table 1.4, includes primarily research-based commercialization activities and engagement activities (also see Perkmann and others, 2013). Similarly, Abreu and Grinevich (2013) defined three categories of commercialization activities: formal commercial activities, such as licensing, spin-outs and spin-offs; informal commercial activities, such as consultancy services and contract research, that are conducted as paid services; and non-commercial activities that are arranged informally for reasons other than market value or financial rewards, such as informal advice, public lectures, showcase events and exhibitions. Other scholars (for example, Gunasekara, 2006; Perkmann and others, 2013; Dalmarco, Hulsink and Blois, 2018) have suggested different categories, indicating the substantial diversity of activities in which universities seeking to be entrepreneurial may be involved.

Table 1.4
Key themes in entrepreneurial university research

Formal/hard/commercialization activities	*Informal/soft/engagement activities*
• Research-led technological innovation	• Collaborative research
• Patenting and licensing of inventions	• Contract research
• Technology transfer offices	• Consulting
• Science parks and incubators	• Ad hoc advice
• Spin-offs	• Networking with practitioners
• External teaching	• Regional governance and leadership
• Academic entrepreneurship	• Human capital development

- Bridging of policy and practice through engagement

Source: Pugh and others (2018, p. 1,837).

However, universities are still expected to maintain their traditional role as higher education institutions, to initiate social changes and to make socioeconomic contributions to their local areas through their capacity to deliver entrepreneurial teaching and learning, as well as training support for entrepreneurship. This role could be exercised through either formal, credit-based degree programmes or a range of extracurricular activities, non-credit courses, lifelong learning modules and even public events related to entrepreneurship. The overarching objective of these teaching components focused on entrepreneurship is to instil and shape an entrepreneurial mindset and the skills and behaviour of the participants (Wilson, 2008; Sam and van der Sijde, 2014), which helps to foster the entrepreneurship capital of society (Audretsch, 2014). In this respect, entrepreneurship education is another essential means for universities to achieve knowledge diffusion and spillover, alongside commercialization and engagement activities (Pugh and others, 2018; Klofsten and others, 2019). This understanding justifies the notion that "the entrepreneurial paradigm is by no means confined to newly invented technologies or research-intensive universities. It can be enacted at teaching as well as research universities" (Etzkowitz and others, 2000, p. 314).

In sum, an analysis of entrepreneurial universities requires a broad perspective that acknowledges and appreciates the heterogeneity of roles and activities that universities could pursue for their entrepreneurial transformation (Kitagawa, Sánchez-Barrioluengo and Uyarra, 2016; Sánchez-Barrioluengo, Uyarra and Kitagawa, 2019). Moreover, such heterogeneity exists not only across universities but also within individual institutions and across their many internal entities, whether disciplinary faculties and departments or interdisciplinary centres and units (Pugh and others, 2018). Duruflé, Hellmann and Wilson (2018, p. 619), for example, cited the Massachusetts Institute of Technology, at which "entrepreneurship is not only pervasive across the entire university, it is also highly decentralized. Different parts of the university pursue different programmes, generating considerable diversity" and occasionally overlapping. The same diversity is also observed at Stanford University and the University of Oxford. Furthermore, one also needs to recognize that the set of roles and activities adopted by a university will evolve over time in response to external and internal conditions, including stakeholder demands. Experts therefore warn that a one-size-fits-all approach to profile and assess entrepreneurial universities is neither appropriate nor realistic.

2.3 Key institutional attributes and features for enacting entrepreneurial universities

Etzkowitz and others (2000, p. 319) stressed that the transformation of entrepreneurial universities "required new institutional orderings and modified academic regimes that govern and reward entrepreneurialism". The institutional arrangements for fulfilling the extended missions of entrepreneurial universities are likely to depart significantly from those deemed adequate for traditional teaching and research universities (Pinheiro and Stensaker, 2014). An entrepreneurial university's institutional arrangements must be able to integrate the multiple missions and shape the decision-making and implementation of entrepreneurial strategies across the university with a view to achieving the specified outcomes and impact (Sánchez-Barrioluengo and Benneworth, 2019).

Accordingly, Clark (1998) articulated the following five features of institutional configuration, which are essential to the entrepreneurial transformation of universities:

- A diversified funding base and financing strategy to reduce dependence on public/government funding and to enlarge "third stream" funding sources (e.g., university-generated income, private organized funding or other government sources).

- The creation of a new steering core that could operationally reconcile and integrate new managerial values and traditional academic ones, in order to reduce academic tensions and achieve "collegial entrepreneurialism".

- An "integrated entrepreneurial culture" and a shared vision that are embraced at all levels and spheres of the university.

- A vibrant academic environment that accepts a modified belief system and is aimed at preserving a loosely coupled organization that promotes academic freedom while also allowing central managers to take control of coordinating core entrepreneurial activities. This approach could encourage academics to engage in both entrepreneurial and traditional activities. More importantly, it could help to nurture "a core group of academics who are actively engaged, who see that engagement as being scientifically legitimate" within the institution (Sánchez-Barrioluengo and Benneworth, 2019, p. 208). This core group could spearhead entrepreneurial transformation.

- The development of peripheral units (e.g., technology transfer and licensing offices, self-financing research centres, consulting organizations, contract research offices, incubators and science parks) outside traditional academic and administrative departments, to promote new thinking and practices in working with internal and external environments.

The alignment of leadership, governance and management structures with entrepreneurial missions and goals was articulated by Sporn (2001) as fundamental to enhancing the adaptability of universities to enable them to cope with changing external needs and expectations. Specifically, it requires committed leaders who could provide visionary direction, the necessary resources, shared governance involving the participation of all major groups, and professional and specialized administrative and management units that could coordinate and implement core academic activities across the institution. Based on case studies of universities in the United States and Europe, the key institutional arrangements were framed by Sporn (2001) as seven propositions, as depicted in table 1.5.

Table 1.5
Seven propositions for a theory of adaptation

Critical factors	*Propositions*
Environment	Adaptation at universities is triggered by environmental demands that can be defined as a crisis or an opportunity by the institution.
Mission, goals	In order to adapt, universities need to develop clear mission statements and goals.
Culture	An entrepreneurial culture enhances the adaptive capacity of universities.
Structure	A differentiated structure enhances adaptation at universities.
Management	Professionalized university management helps adaptation.
Governance	Shared governance is necessary to implement strategies of adaptation.
Leadership	Committed leadership is an essential element of successful adaptation.

Source: Sporn (2001, p. 129).

The emphasis that entrepreneurial culture and behaviour must be embedded as an integral part of a university's missions to enable success is also echoed in Kirby (2006), who

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specified the strategic actions to be instilled in different institutional arrangements, thereby enabling entrepreneurial culture and behaviour (see table 1.6) to pervade the whole university.

Table 1.6
Proposed strategic actions for promoting enterprise

Action	*Activity*
Endorsement	At the higher level; senior staff act as role models
Incorporation	Into the university, faculty/departmental and personal plans
Implementation	Setting targets that are monitored
Encouragement and support	Hard support: enterprise laboratories, pre-incubators, incubators, science parks, meeting rooms, computing support, office support services and seed corn funding
	Soft support: training, mentoring and advice, signposting to sources of external support, ongoing technical and management support once the venture is launched
Recognition and reward	Equity sharing, promotion, etc.
Organization	Interdisciplinary research and teaching groups, educational partnerships, a multidisciplinary entrepreneurship centre
Promotion	Business plan competitions, entrepreneurship "halls of fame", cases, role models

Source: Kirby (2006, p.601).

In sum, the transformation of universities into entrepreneurial entities must be accompanied by synchronized changes in both the hard and the soft elements[7] of the whole organization. Despite the emphasis on the role of leadership, this process transcends the conventional understanding of either a pure top-down or a bottom-up approach. In particular, Clark (2001, p. 15) stressed that "extremely personalized forms of leadership – the dictator, the tyrant, the authoritarian figure – do not endure in universities and cannot be a permanent feature in entrepreneurial universities". On the other hand, while a strong central direction is fundamental to securing a shared vision and unity (Pinheiro and Stensaker, 2014), it also requires a strong and proactive faculty and departmental steerage, which allow the university to become "a capacious institution, with the ability to periodically reinvent itself and incorporate multiple missions" (Etzkowitz, 2013, p. 489).

2.4 Guiding Framework for Entrepreneurial Universities of the Organisation for Economic Co-operation and Development and the European Commission

The Guiding Framework for Entrepreneurial Universities of the Organisation for Economic Co-operation and Development and the European Commission synthesizes the above-mentioned characteristics, in terms of the institutional attributes and features, and the roles and activities that are found to be common and/or essential to the creation of

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[7] The McKinsey 7S framework, for example, differentiates hard elements as systems, strategy and structure, and soft systems as shared values, staff, (leadership and management) style and skills (see https://strategicmanagementinsight.com/tools/mckinsey-7s-model-framework/).

entrepreneurial universities. Accordingly, the Guiding Framework could serve as an indicative and guiding tool for universities as they assess the current state of their entrepreneurial transformation and pinpoint potential areas for action. Specifically, the Guiding Framework categorizes the characteristics into seven areas, as follows:

(1)   Leadership and governance

(2)   Organizational capacity, people and incentives

(3)   Entrepreneurship development in teaching and learning

(4)   Pathways for entrepreneurs

(5)   University-business/external relationships for knowledge exchange

(6)   The entrepreneurial university as an internationalized institution

(7)   Measuring the impact of the entrepreneurial university

Areas 1 and 2 specify the internal institutional arrangements and mechanisms, including a shared vision and values, governance, key management systems and operational mechanisms that are fundamental to upholding the overall entrepreneurial strategy. Areas 3, 4, 5 and 6 highlight key areas that illustrate the entrepreneurship and entrepreneurial activities of the university, which could be associated with specific outcomes and impacts relevant to the entrepreneurial strategy. Area 7 is focused on awareness and understanding of the impact to be made and, more importantly, whether the intended impact has been clearly monitored and measured by the university to track progress. Connections between the seven areas are depicted in figure 1.2.

Figure 1.2
Connection between the areas in the Guiding Framework

Organizational architecture	1. Leadership and governance 2. Organizational capacity, people and incentives
Key areas illustrating entrepreneurship and entrepreneurial activities	3. Entrepreneurship development in teaching and learning 4. Pathways for entrepreneurs 5. University-business/external relationships for knowledge exchange 6. The entrepreneurial university as an international institution
Impact creation and assessment	7. Measurement of impact

Source: Author.

3. National survey results in Ethiopia and Ghana

The present section contains a synthesis of the findings drawn from the national survey data collected in Ethiopia and Ghana. First, the state of development of universities in the two countries in advancing the entrepreneurial mission were compared and assessed using the seven broad areas of the Guiding Framework. Second, the recognition of specific strategies relevant to the transformation into entrepreneurial universities was examined. Third, the funding for entrepreneurial strategies and activities was compared.

The synthesized analysis was conducted based on the questionnaire responses that were recorded and made accessible on the electronic platform (i.e., Google Forms) only. In all, there were 22 responses from Ethiopia from four universities. All 22 responses were included for the country-level analysis but only 21 responses from three universities were used for the university-level analysis, excluding one university that provided a single response. As for Ghana, a total of 38 responses from seven universities recorded in Google Forms were used for both the country-level and the university-level analysis.

Detailed country-level analysis and discussion of the national findings of the two countries are included in Part II of the report.

3.1 Background information

Ethiopia and Ghana diverge in the development trajectory and governance structure of the education system, in general, and the tertiary/higher education system in particular. However, the latest education policies and strategic plans of the two countries share a strong emphasis on equity/accessibility, quality and the relevance of tertiary/higher education to meeting labour market requirements and national development and community needs. In the Education Sector Development Programme of Ethiopia for the period 2015–2020, five key components related to the development of higher education are identified: university expansion and consolidation; equity enhancement; relevance and quality enhancement; research, technology transfer and community engagement; and institutional collaboration, leadership and governance (Ethiopia, Federal Ministry of Education, 2015). The tertiary education strategies outlined in the Education Strategic Plan 2018–2030 of Ghana entail similar strategic directions so as to meet the country's three tertiary education policy objectives: improving equitable access to and participation in inclusive education at all levels; improving the quality of teaching and learning and science, technology, engineering and mathematics subjects at all levels; and ensuring the sustainable and efficient management, financing and accountability of education service delivery (Ghana, Ministry of Education, n.d.).

Neither of the strategic plans include explicit statements about the entrepreneurial role of tertiary or higher education in societies and/or the need for the universities or other higher education institutions to develop entrepreneurial attributes and/or activities. Even the words "entrepreneurial" and "entrepreneurship" are used sparingly in the two strategic plans (in particular, in the plan of Ghana); they are therefore primarily used in relation to the teaching-related mission (i.e., the first mission) of universities, with a focus on the need for entrepreneurial skills, and thus for an entrepreneurship curriculum and related training as part of a technical and vocational education. Nonetheless, one could say that specific strategic directions, such as increasing links

and engagement with industry, aligning research with national priorities, contributing to national development and community needs (e.g., through teaching, research and knowledge, and/or technology transfer), and diversifying sources of income, could be related to some key areas that are considered to be important in the transformation of entrepreneurial universities, as mentioned in section 2.

3.2   Advancing entrepreneurial universities in Ethiopia and Ghana

Based on the survey results, the state of development of entrepreneurial universities in Ethiopia appears to be lagging behind that in Ghana in all seven areas specified in the Guiding Framework. As shown in figure 1.3, Ethiopia received a mean score over 3 in only three areas, namely leadership and governance (3.04), external knowledge exchange (3.40) and internationalization (3.49), meaning that there were fewer respondents who reported these areas as adequate (rating 4 or above) in their universities. In contrast, all seven areas in the Ghana survey consistently received a mean score over 3, with three areas achieving an average score over 4, namely leadership and governance (4.06), external knowledge exchange (4.26) and internationalization (4.59). This suggests that a majority of respondents in Ghana found these areas to be adequate in their institutions.

Looking at the two radar plots, one could observe that the pattern is similar for the two countries, despite the differences in their mean scores for the seven areas, which suggests that the areas that the respondents in the two countries found to be inadequate and adequate were quite consistent when the data are compared at the country level. For example, the two areas that scored the lowest in both countries are: organizational capacity, people and incentives; and impact measurement. In Ethiopia, the mean scores of these two areas are 2.59 and 2.51, respectively. In Ghana, the mean scores of these two areas are 3.49 and 3.34, respectively. The three areas that recorded the highest mean scores in both countries are: leadership and governance; external knowledge exchange; and internationalization.

Figure 1.3
Rating of the seven areas of the Guiding Framework by respondents from Ethiopia and Ghana
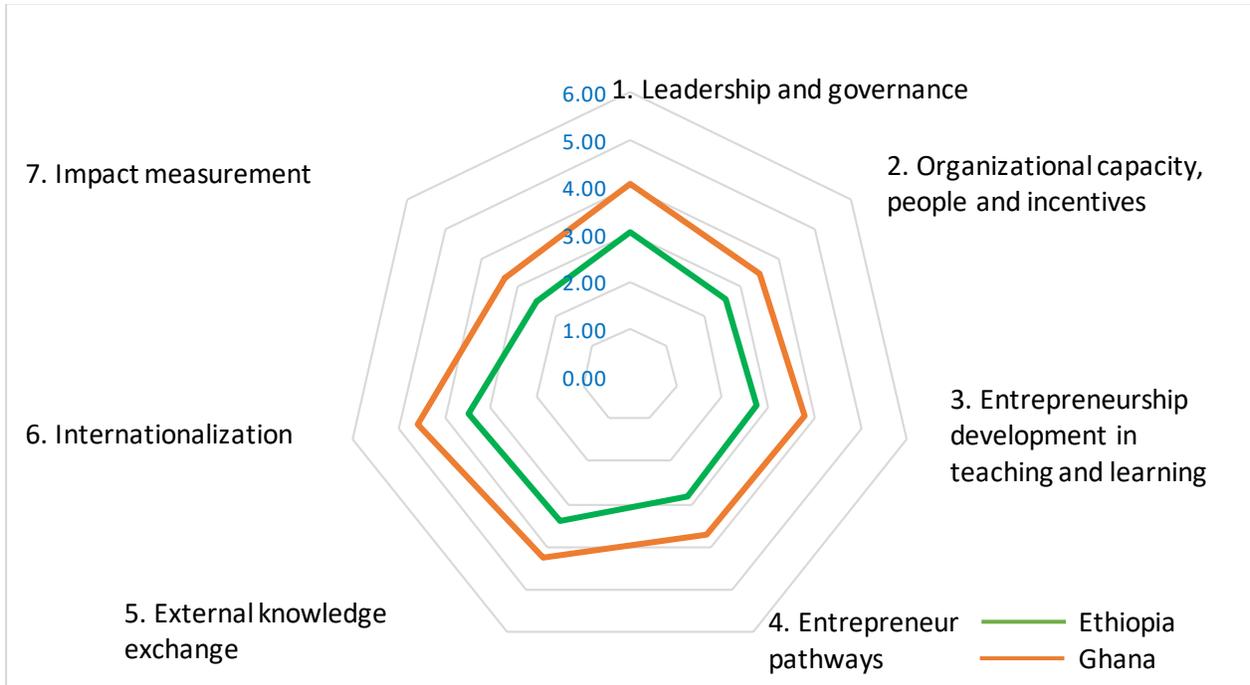
Source: United Nations, Economic Commission for Africa (ECA), Advancing entrepreneurial universities in Africa survey, 2021.

The respondents in each country were further divided by: roles (leadership and management; research and teaching); and disciplines (social sciences; sciences) for analysis of the survey data. Considering that there is no unified definition of entrepreneurial universities and their heterogeneity, as discussed earlier, it was expected that respondents in different roles and/or with different disciplinary backgrounds and positions might vary in their interpretation of the concept, as well as their personal experience of entrepreneurial features and activities at their institutions. Probing into such differences may generate more insights from the data.

3.2.1 Difference by role of respondents

Based on the survey data of Ethiopia (see figure 1.4), the mean scores of all seven areas of entrepreneurial universities by respondents in leadership and management positions were consistently higher than the mean scores by respondents in research and teaching positions. The gap was found to be significantly wider in the following areas: leadership and governance; entrepreneurship development in teaching and learning; pathways for entrepreneurs; external knowledge exchange; and internationalization. On the other hand, responses appear to be more consistent between the two roles in the following areas: organizational capacity, people and incentives; and impact measurement. These are the two areas that had the lowest mean value at the country level.

The survey data of Ghana presented a different picture (see figure 1.5). The mean scores of all seven areas of the two position-based groups were consistent, with only slight differences in the areas of: entrepreneurship development in teaching and learning; external knowledge exchange; and impact measurement. In those areas, respondents in research teaching positions even rated some of the areas slightly higher than those in leadership and management positions.

Figure 1.4

Mean scores of the seven areas of entrepreneurial universities in Ethiopia: by position of respondents
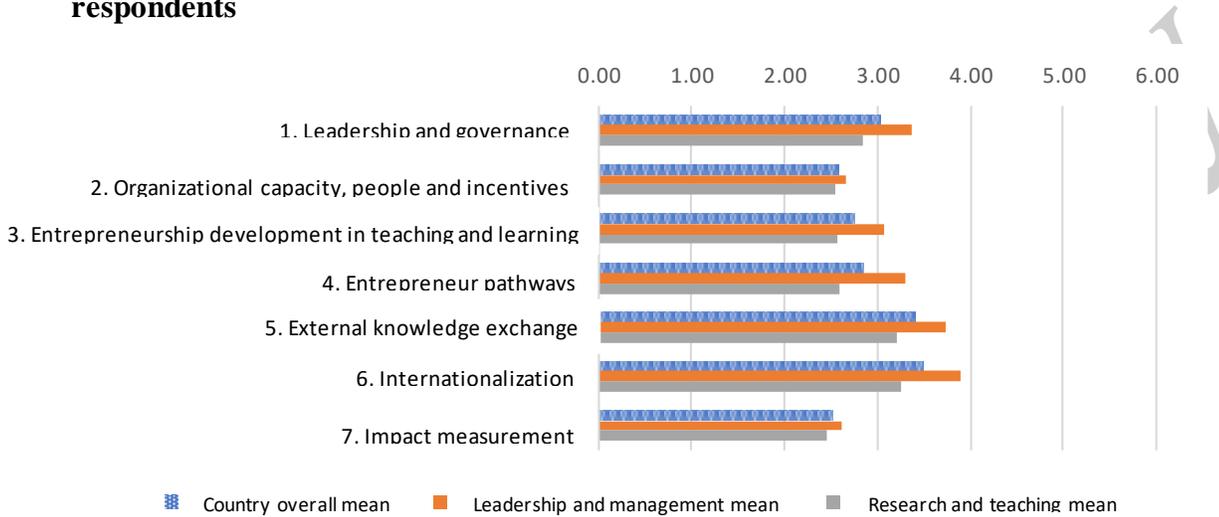
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

Figure 1.5

Mean scores of the seven areas of entrepreneurial universities in Ghana: by position of respondents
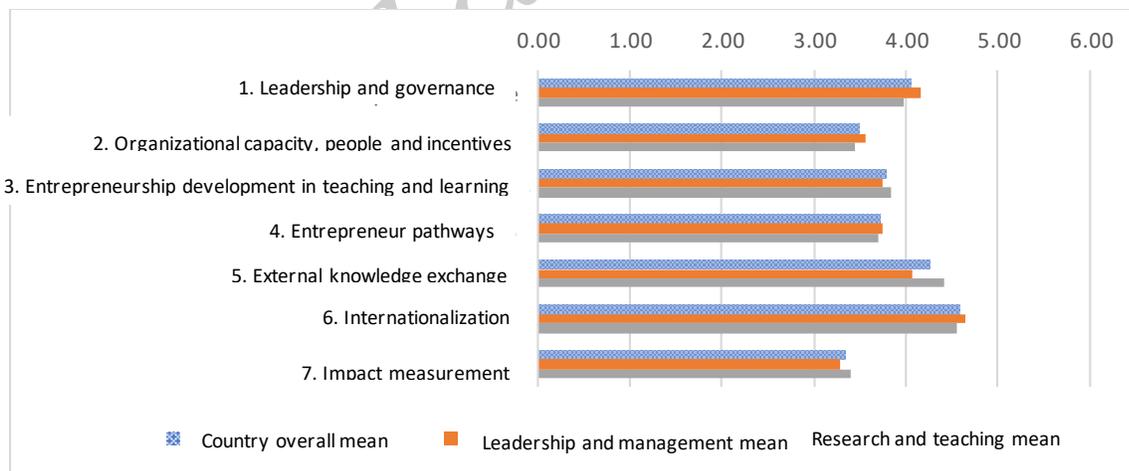
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.2.2 Difference by discipline

The survey data from Ethiopia (see figure 1.6) show that the mean scores from respondents in social sciences were significantly higher than by respondents from the sciences (i.e., the typical science, technology, engineering and mathematics disciplines) in almost all areas, except in internationalization, the only area in which the mean score of respondents from the sciences was higher. In the area of external knowledge exchange, the mean scores reported by respondents in both disciplines in Ethiopia were similar. As mentioned in section 4.1, this is an area on which the Ethiopian Education Sector Development Programme 2015–2020 places significant emphasis.

The Ghana survey data (see figure 1.7) show that the mean scores of respondents from the social sciences were consistently higher in all areas, with the most significant differences observed in the areas of: leadership and governance; entrepreneurship development in teaching and learning; and pathways for entrepreneurs.

Entrepreneurship is a social sciences discipline and an important subject area in many schools and faculties of business and management. Accordingly, it is likely that initiatives and measures related to the areas for creating entrepreneurial universities are more explicitly and intensively promoted and diffused in social sciences than in science schools and faculties. It is also possible that respondents in the science, technology, engineering and mathematics disciplines, in which research generates technologies that need patenting, licensing and transferring, face different issues than those in social sciences that lead training, contractual and advisory services related to entrepreneurship.

Figure 1.6
Mean scores of the seven areas of entrepreneurial universities in Ethiopia: by discipline of respondents
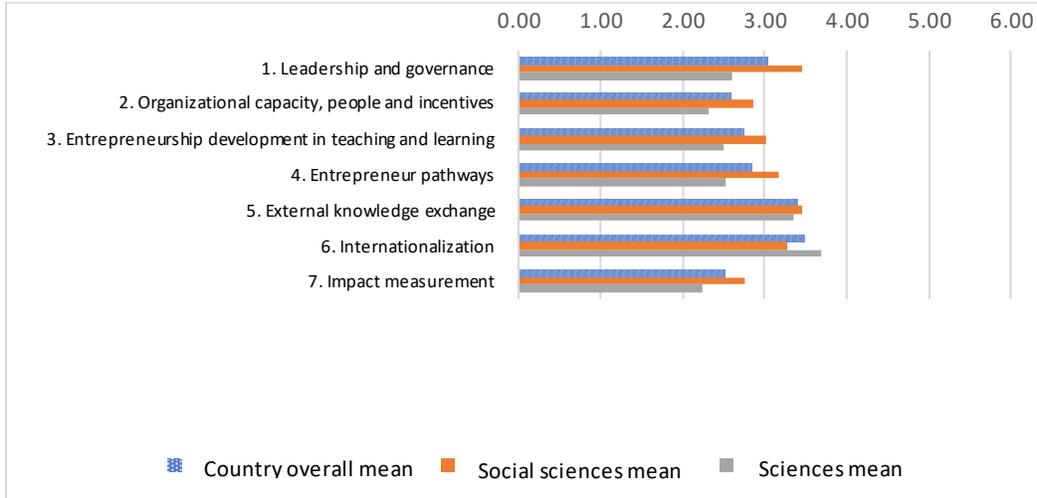
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

Figure 1.7
Mean scores of the seven areas of entrepreneurial universities in Ghana: by discipline of respondents
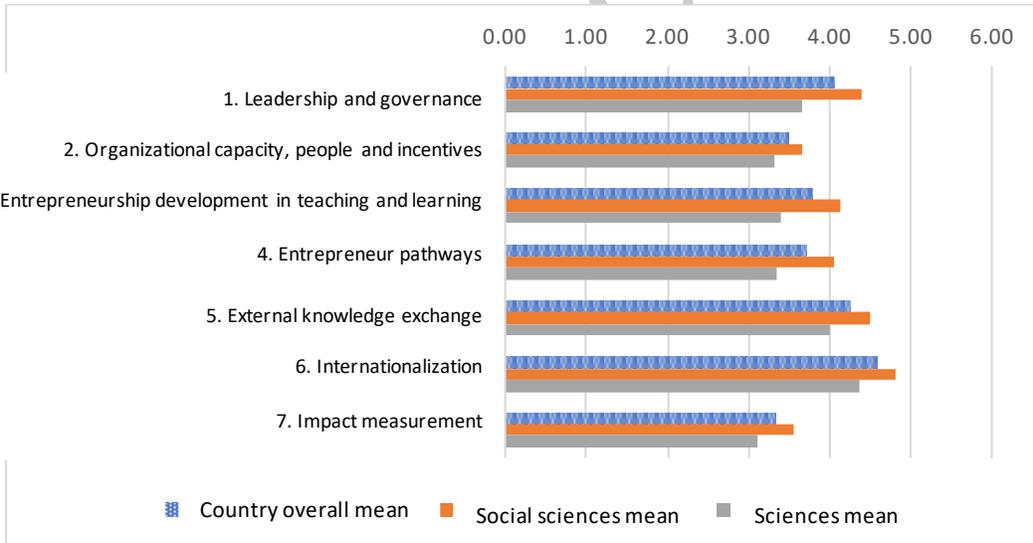
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.2.3 Detailed overview of the findings

In the following sections, the state of development of each of the seven areas is compared based on the survey data of the two countries. Each of the seven aspects is analysed individually to gain more insight into the individual aspects that could help to inform action.

Leadership of the university and the governance arrangements are critical to shaping the development trajectory of entrepreneurial universities. As noted earlier, the scores of Ghana were generally higher than those of Ethiopia in all 10 of the items measured. However, there are observable differences between areas in which Ethiopia or Ghana seem to be scored higher or lower. The highest scores of Ghana are in the items that address the broad integration of entrepreneurship (item 1.1) in the mission and strategy of the university and the level of commitment (item 1.2), while the highest scores of Ethiopia were in providing critical services to surrounding communities (item 1.9) and developing initiatives and programmes that drive entrepreneurship (item 1.5). For details, see figure 1.8.

Notwithstanding the above-mentioned differences, the lowest scores for both countries are related to the inability to empower departments to operate autonomously (item 1.4, with mean scores of 2.23 for Ethiopia and 3.66 for Ghana) and develop innovative pathways to market (item 1.6, with sample mean scores of 2.5 for Ethiopia and 3.67 for Ghana). These scores are far lower than the overall mean for the category on leadership and governance, which was 4.06 for Ghana and 3.04 for Ethiopia.

In terms of comparisons on selected items, the proportion of respondents who agreed that "entrepreneurship is clearly integrated as a major part of the university's mission and strategy" (item 1.1) in either country was higher than the proportion that disagreed, but the gap was significantly larger in Ghana (4.45) than in Ethiopia (3.18). On the other hand, the gap was significantly smaller in the two areas related to the university's connection to and/or provision of support for local and wider communities (item 1.5 and 1.9; see figure 1.8 for details).

Figure 1.8
Item rating in the area of leadership and governance by respondents from Ethiopia and Ghana
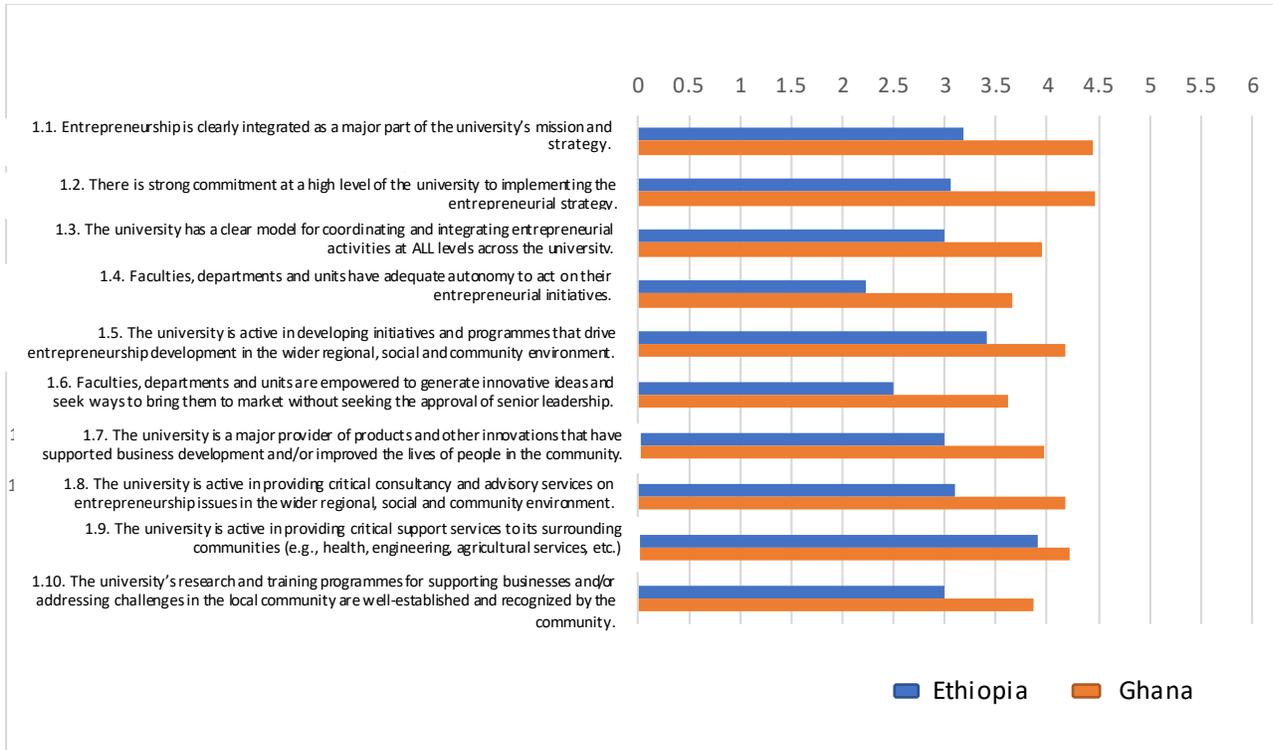
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.3.1 University mission statement

To triangulate the responses to the area of leadership and governance, respondents were asked whether their universities' mission statements explicitly include a list of the key areas to be associated with entrepreneurial universities, with the possible answers "Yes", "No", or "No info/not sure". The overall picture at the country level (see figure 1.8) suggests that the majority of respondents in Ethiopia (over 70 per cent) recognized that their universities' mission statement and strategy clearly specify: knowledge exchange (91 per cent); technology transfer (82 per cent); internationalization (91 per cent); and engagement in the community/regional economic and social development (95 per cent). On the other hand, entrepreneurial learning and teaching and business start-ups/academic spin-offs had the lowest recognition by respondents, with only 41 per cent indicating "Yes" in the survey.

In Ghana, internationalization is the area that received the highest recognition by number of respondents (84 per cent), followed by entrepreneurial learning and teaching (82 per cent) and knowledge exchange (76 per cent). Fewer respondents indicated "Yes" in the survey for the area of commercialization of research outputs/innovation (39 per cent) and business start-ups/academic spin-offs (37 per cent). Given that these are the most recognizable indicators and perhaps the pride

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of most entrepreneurial universities, lower scores may suggest that these activities are rare or poorly marketed.

The recognition of specific areas in the university's mission and strategy by respondents at different universities in either country shows very different and inconsistent patterns (see figures 1.10 and 1.11). The lack of consistent patterns may be caused by any of three reasons: even within the same country, individual universities may place more emphasis on articulating and promoting particular areas of interest for their entrepreneurial strategies and these areas may therefore be more widely recognized; respondents may tend to pay more attention to the areas that are relevant and/or of interest to them, and they may therefore recall these areas more easily and clearly in the survey; or, in a similar vein, respondents may refer to the strategy of their college or school, which may diverge from that of the university. Nonetheless, it has been observed that one or two universities in each country (e.g., university 2 in Ethiopia; universities 3 and 5 in Ghana) could be all-around entrepreneurial universities across more areas than their peers.

However, considering that the number of respondents sampled in each university is small and thus not representative, further investigation requires a larger sample size per university to enable deeper and more robust analyses at the university level.

Figure 1.9
Recognition of individual aspects of the university mission
(Percentage)
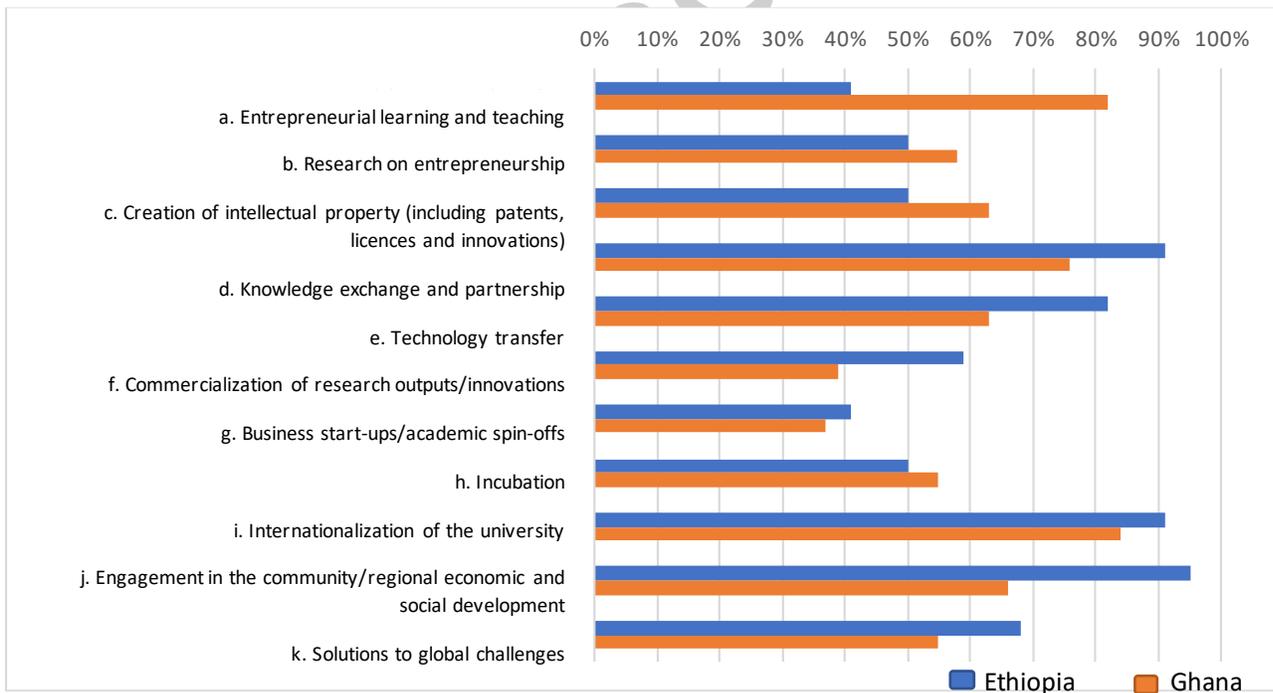
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

Figure 1.10
Recognition of individual aspects of the university mission: universities surveyed in Ethiopia
(Percentage)
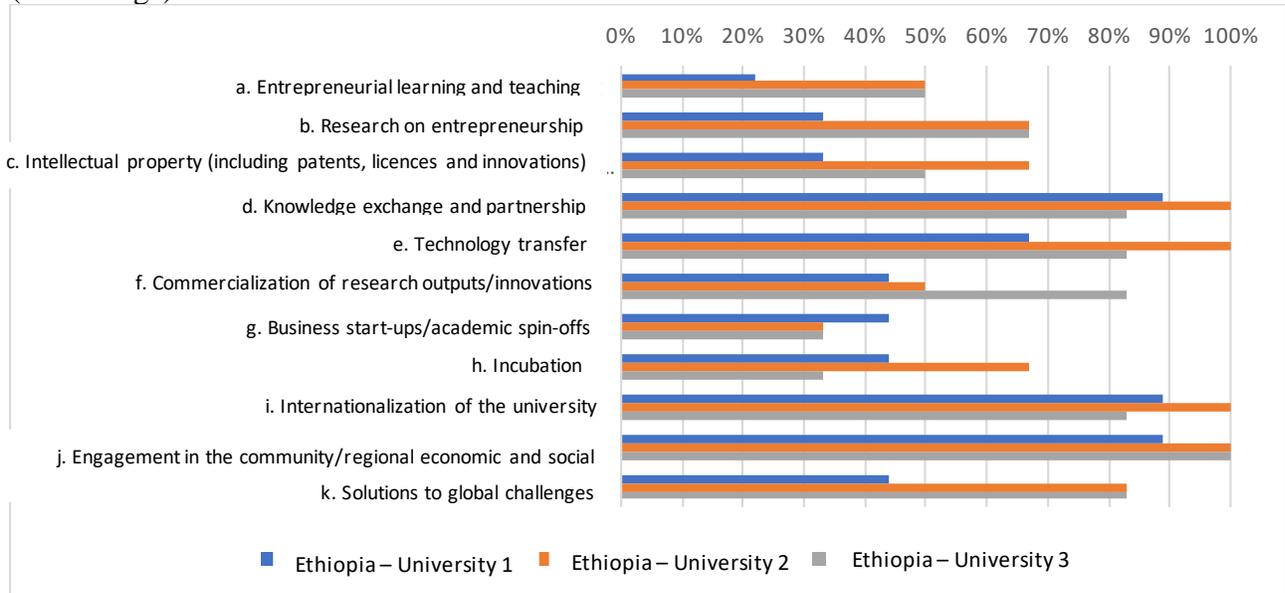
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

Figure 1.11
Recognition of individual aspects of the university mission: universities surveyed in Ghana
(Percentage)
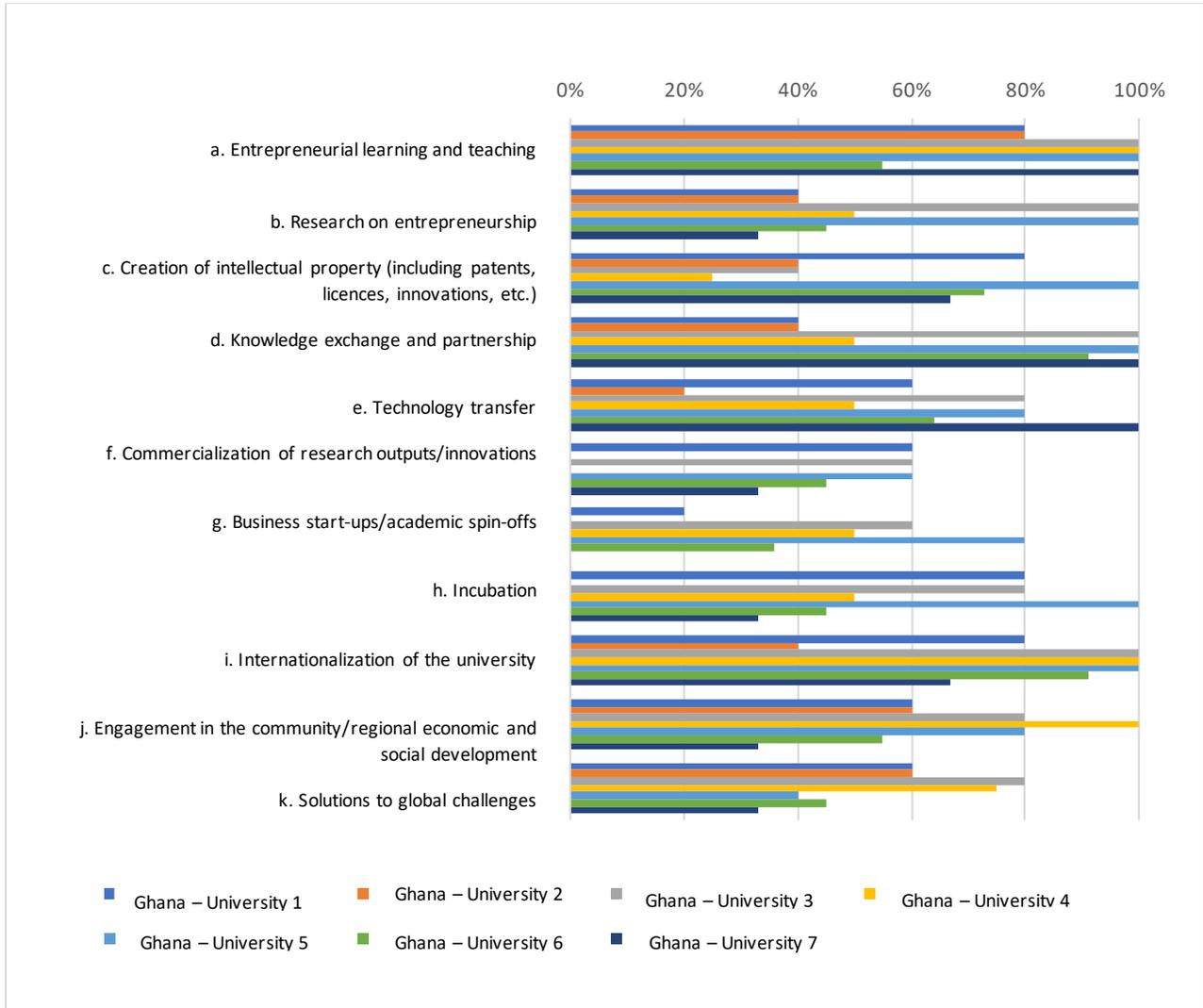
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.3.2 Implementation plan and central mechanisms

In addition to asking whether the university mission statement explicitly includes the above-mentioned areas, respondents were also asked whether there is a clearly published implementation plan for these areas, with the possible answers "Yes", "No", or "No info/not sure" (see figure 1.12). Ghana has four areas in which fewer than 50 per cent of respondents indicated that there are clearly published implementation plans: technology transfer; commercialization of research outputs/innovations; business start-ups/academic spin-offs; and solutions to global challenges. In Ethiopia, there are two areas in which fewer than 50 per cent of respondents clearly indicated that there are clear implementation plans: entrepreneurship teaching and learning; and research on entrepreneurship.

Figure 1.12
Recognition of implementation plans for entrepreneurial strategies
(Percentage)
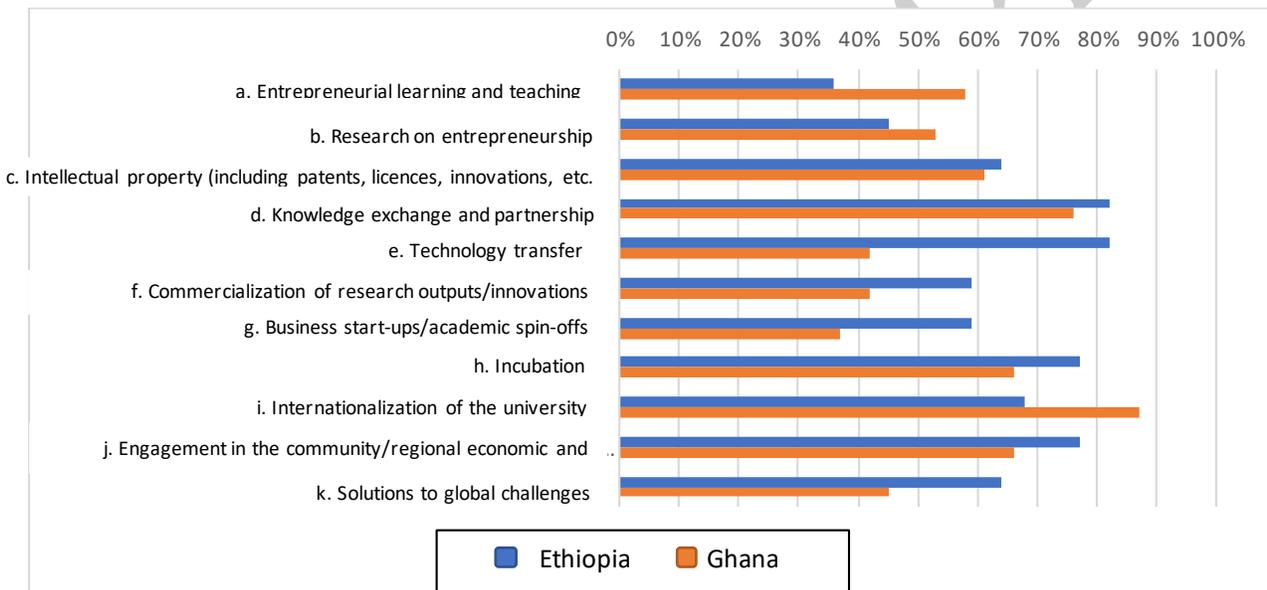
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
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Respondents were further asked whether their universities have three central mechanisms – a leadership position at the university level; a central unit; and individual specialized units – for the implementation of the entrepreneurial strategy across the university. The proportion of respondents that reported "Yes" in the two countries is similar and consistent. Specifically, over 80 per cent of respondents in both countries indicated that their universities have specialized units for coordinating individual entrepreneurial activities (see figure 1.13).

Figure 1.13
Recognition of central mechanisms for implementing entrepreneurial strategies
(Percentage)
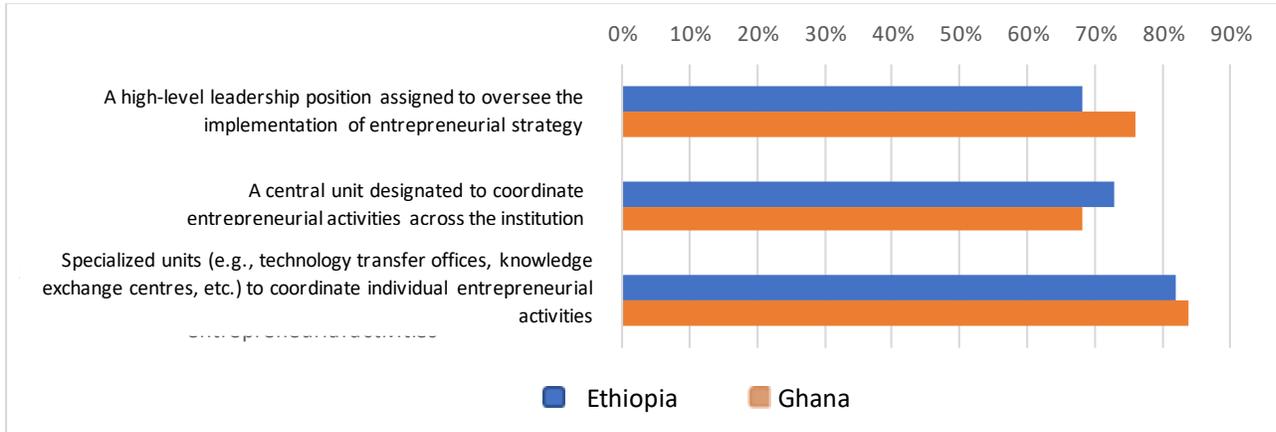
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.4 Organizational capacity, people and incentives

Of the seven areas in the Guiding Framework, this is the area in which both countries scored the lowest. Referring to figure 1.14, the mean score of Ethiopia is below 2 for all items measured in this area, except for item 2.4: "The university is open to recruit practitioners with business/entrepreneurship experience to take up teaching, training and research positions", which has a mean score of 3.23. While the number of respondents who agreed that this item was adequate was higher than the number of respondents that disagreed, a significant proportion of respondents held a neutral stance, which suggests that this area may still be underdeveloped.

In contrast, Ghana scored above the mean in almost all items except item 2.8 ("The university has adequate entrepreneurial support targeting female staff and external partners": mean score 2.97) and item 2.9 ("Involvement in entrepreneurial activities is included as a key criterion in the performance appraisal and promotion of staff": mean score 2.84), meaning that more respondents saw these two aspects as inadequate as part of the internal organizational system for promoting entrepreneurship.

Figure 1.14
Item rating in the area of organizational capacity, people and incentives
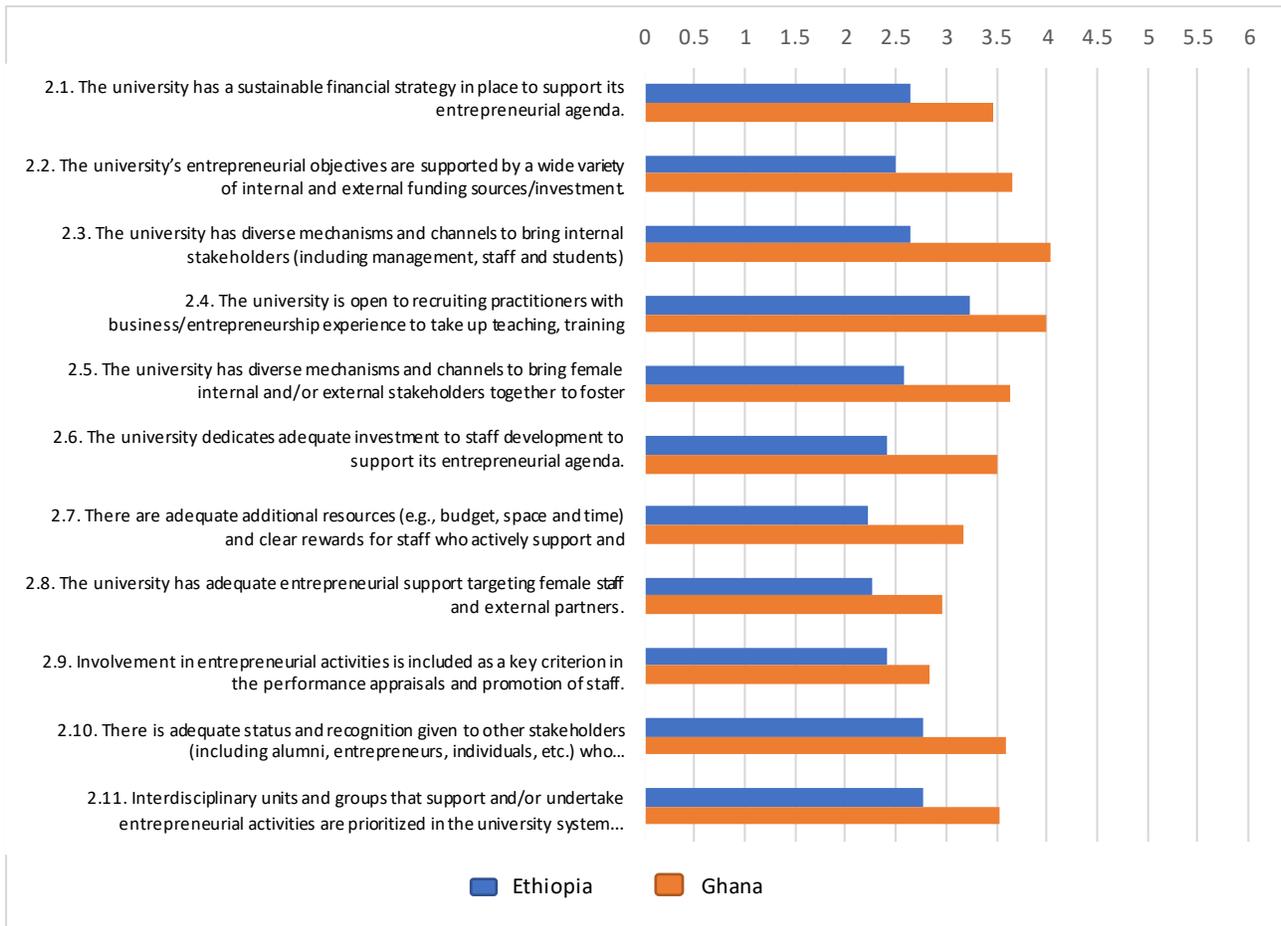
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.5 Entrepreneurship development in teaching and learning

In terms of entrepreneurship development in teaching and learning (see figure 1.15), the mean score of Ethiopia is under 2 in almost all measured items except item 3.9 ("The university actively delivers upskill/reskill entrepreneurship training for business and workforce in the community": mean score 3.05). However, the proportion of respondents agreeing and disagreeing that this aspect was adequate was almost equal (around 36 per cent).

In contrast, Ghana scored well (a mean score over 3.5) in all items in this area except for item 3.2 ("Entrepreneurial training and development for staff takes place in ALL parts of the university": mean score 3.18). However, a majority of respondents (77 per cent) agreed that their respective institution "strongly encourages and supports staff in creating new curricula related to entrepreneurship" (item 3.4, mean score 4.08). The contrasting opinions on these two items, which both emphasize training and development for staff, may be a case of knowledge asymmetry, or an indication that staff training across the university is much more essential to enabling the creation of new curricula than other aspects of training and development.

Figure 1.15
Item rating in the area of entrepreneurship development in teaching and learning
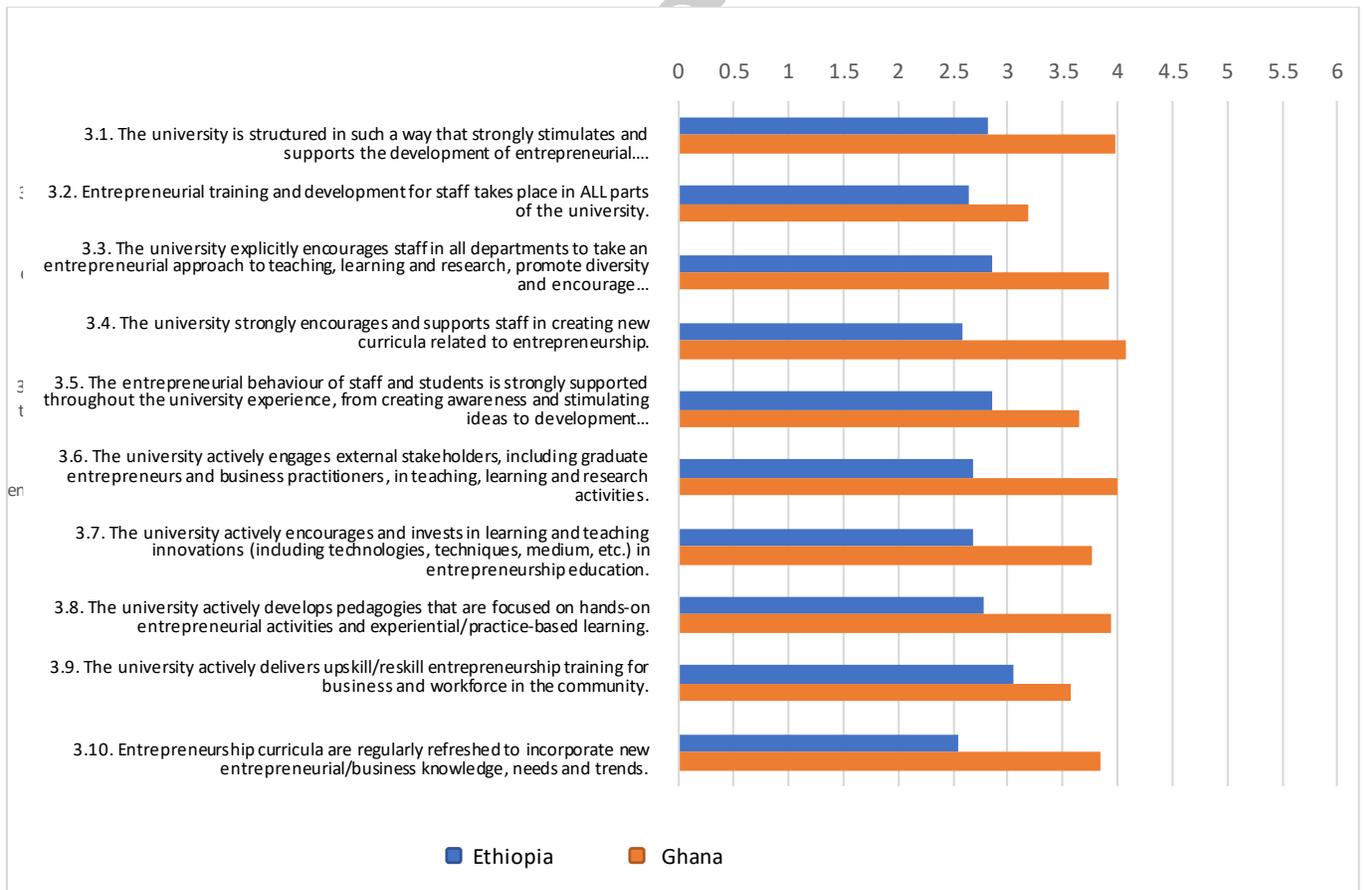
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

Further probing into the availability of services and programmes that support entrepreneurship development in teaching and learning, the data show that Ethiopia lags significantly behind Ghana in most of the aspects on which respondents were surveyed (see figure 1.16). For example, over 80 per cent of respondents in Ghana indicated that their universities have new entrepreneurship-related programmes and courses that have been introduced in the past three years, but fewer than 40 per cent of respondents in Ethiopia said the same. Furthermore, a majority of respondents (over 60 per cent) in Ghana also indicated that there were programmes and initiatives to involve private sector innovators and/or entrepreneurs in teaching and research, as well as in entrepreneurship-related extracurricular activities and events.

The two areas found to be lacking or insufficient in both countries are: the involvement of external stakeholders in reviewing entrepreneurship-related programmes and projects, which is deemed useful to ensuring the relevance and practical value of these programmes and projects to industry; and staff development programmes for entrepreneurial skills, knowledge and techniques for teaching and learning, which may directly affect the quality of the entrepreneurship education that the universities design and deliver.

Figure 1.16
Recognition of services and programmes for entrepreneurship development in teaching and learning
(Percentage)
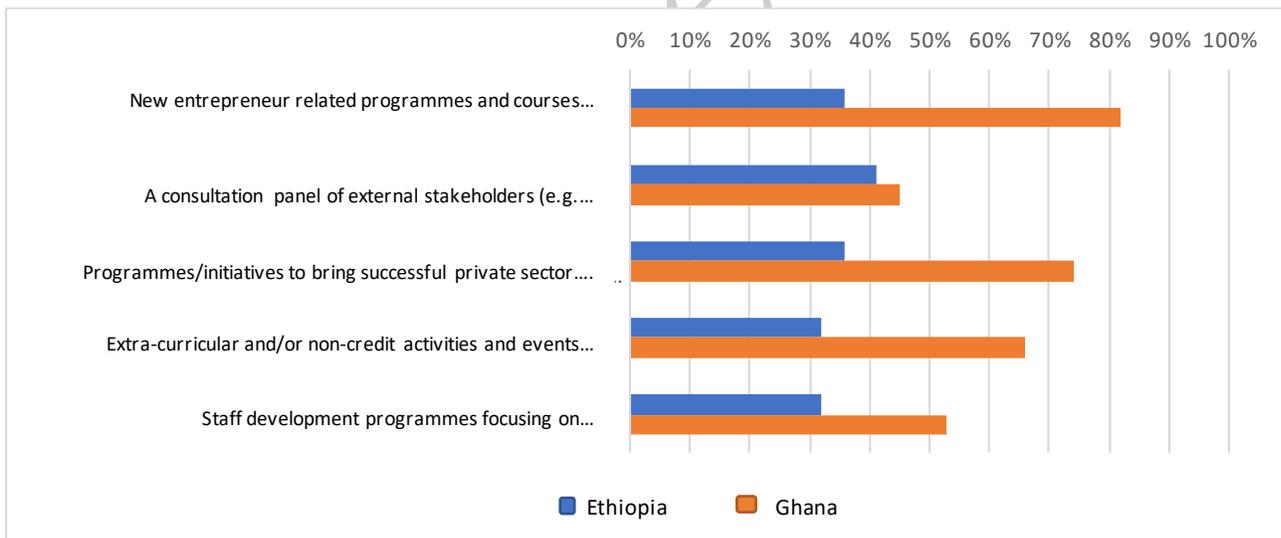
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.6   Pathways for entrepreneurs

Data from Ethiopia suggest that the respondents had varied opinions on the different items associated with this specific area. Specifically, a majority of the respondents (55 per cent) agreed that their university managed to "provide needed access to business incubation facilities for its staff and students" (item 4.7, mean score 3.41), and "actively raise awareness of the value and impact of developing entrepreneurial mindsets and skills among its staff and students; and encourage them to become entrepreneurial" (item 4.1, mean score 3.32). On the other hand, most respondents (55 per cent) found the provision of mentoring by practising entrepreneurs (item 4.5,

mean score 2.36) and access to financing or investment to put entrepreneurial ideas into action (item 4.6, mean score 2,18) to be inadequate. For details, see figure 1.17.

Ghana performs well in all aspects in this particular area (see figure 1.17), with more respondents agreeing that they were adequate than those who disagreed. Specifically, a significant number of positive opinions (>65 per cent) are reported about item 4.7 (mean score 4.29) and item 4.1 (mean score 4.11), as in the above-mentioned case of Ethiopia.

Figure 1.17
Item rating in the area of pathways for entrepreneurs
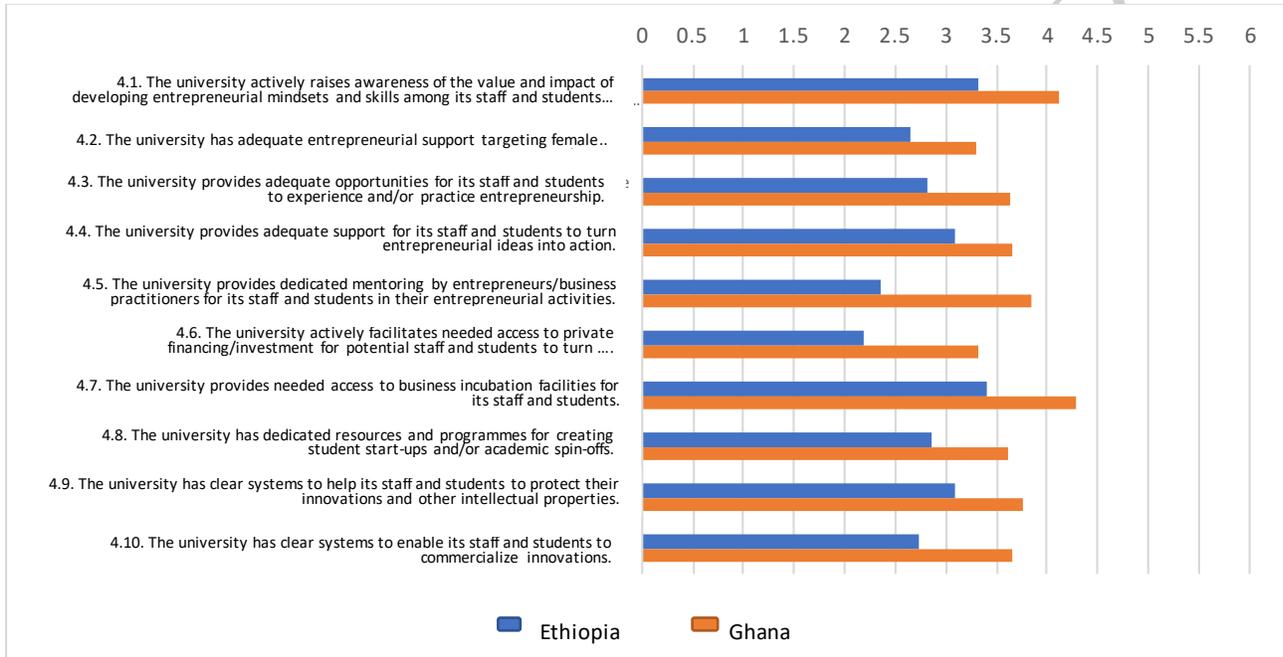
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.7 External knowledge exchange

A number of associated aspects to this specific area were reported as adequate by respondents in both countries, in particular in Ghana (see figure 1.18). Respondents in Ethiopia, however, found two aspects to be particularly inadequate. These include item 5.6, which involves a clear system for external stakeholders to exploit their universities' intellectual property (mean score 2.73) and item 5.2, which is related to links and partnerships with external incubators, science parts and other platforms (mean score 2.86).

In general, a majority of respondents in Ghana found all aspects to be adequate, with a significant proportion (80 per cent or more) of respondents agreeing that their universities are committed to building local exchanges and collaborative relationships (item 4.1, mean score 4.58), as well as international ones (item 4.2, mean score 4.63).

Figure 1.18
Item rating in the area of external knowledge exchange
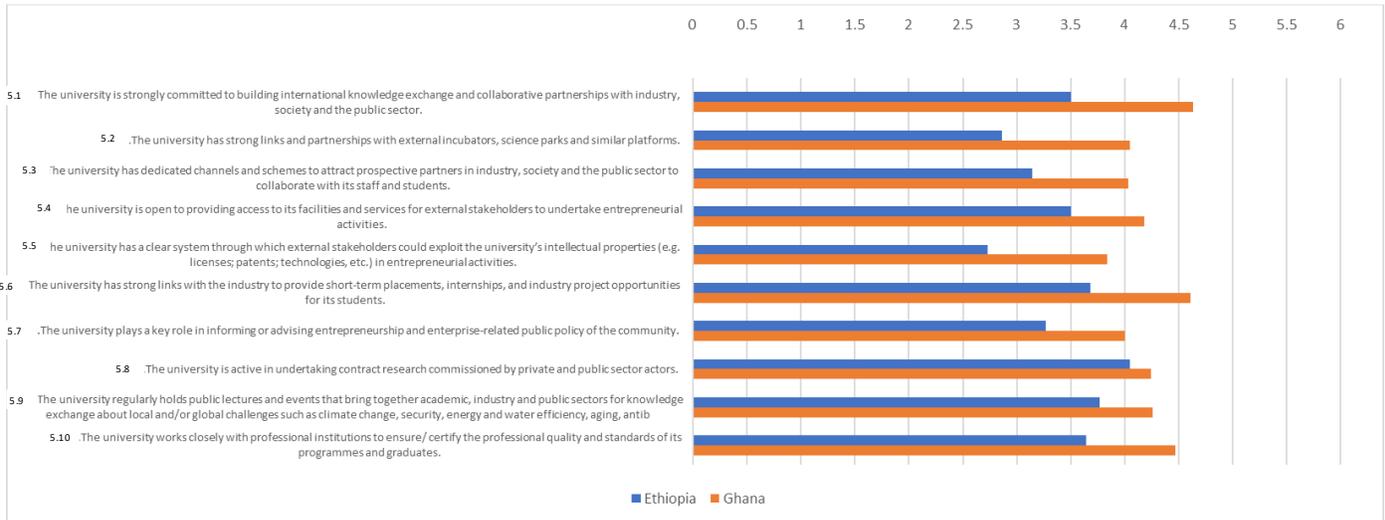
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.8   The entrepreneurial university as an international institution (internationalization)

Respondents in both countries reported positively on this specific area, rating it adequate, with the majority of mean scores above 3 (see figure 1.19). The only exception is item 6.1 ("Internationalization is a key part of the university's entrepreneurial strategy") in the survey in Ethiopia, which was found to be inadequate by more respondents than not (mean score 2.91). Item 6.1 is also the aspect on which Ethiopia has the widest gap with Ghana. While this aspect was seen as inadequate, the other aspects were considered adequate (mean scores above 3) by more respondents in Ethiopia than in Ghana.

The overall rating of this area in Ghana is the highest among the seven areas, with most respondents (over 65 per cent) considering each of these areas adequate. This is particularly clear in item 6.4 regarding the university's active efforts to "raise its international profile and ranking" (mean score 4.95) and item 6.5 about whether the university "explicitly encourages and supports education and research initiatives that address global challenges" (mean score 4.87), with 87 per cent of respondents considering these two aspects to be adequate.

Figure 1.19
Item rating in the area of internationalization
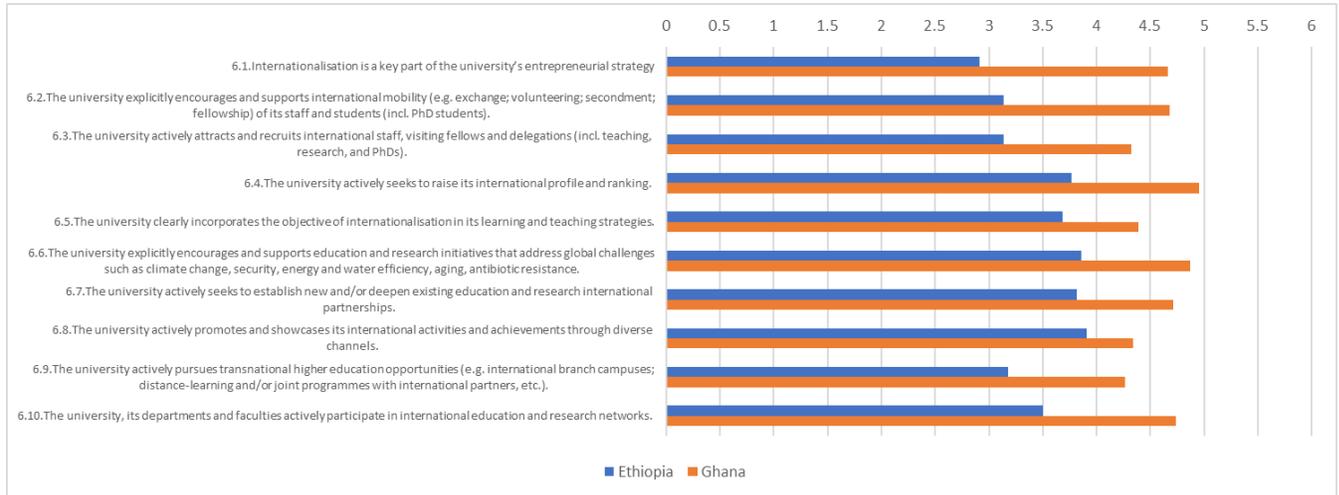
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

In terms of the availability of services and programmes for the promotion of the internationalization of the university surveyed, they appear to be more adequate or acknowledged in Ghana than in Ethiopia based on the survey results (see figure 1.20). The only area in which both countries have similar results is joint degrees and research programmes with international partners, with 59 per cent of respondents from Ethiopia and 63 per cent from Ghana indicating that these programmes are available in their universities. However, with regard to international mobility programmes for students, Ghana clearly leads, with 87 per cent of respondents indicating that their universities have them, compared with only 59 per cent of respondents in Ethiopia. Ethiopia also lags behind in the availability of joint research centres with international partners, with just half (50 per cent) of the respondents indicating that such centres exist, compared with 63 per cent of respondents in Ghana.

Figure 1.20
Teaching and research programmes with international partners
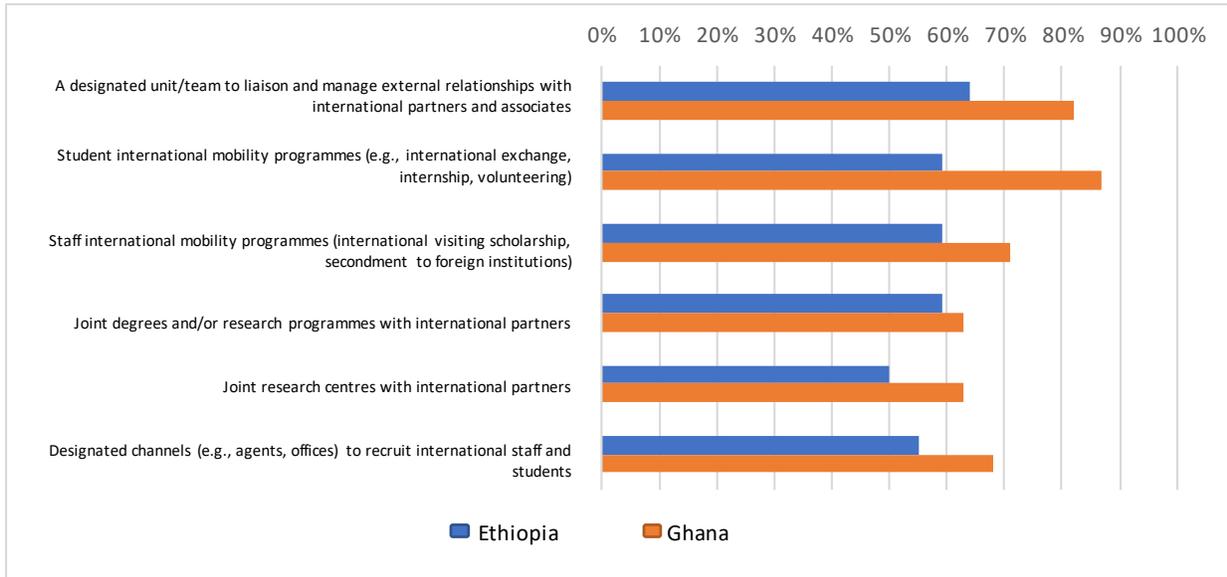
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.9   Impact measurement

This area is the most underdeveloped of the seven areas in both countries, based on the survey data, although Ghana still appears to perform better than Ethiopia (see figure 1.21). More respondents in Ethiopia reported all aspects associated with this area to be inadequate than adequate. The aspect with lowest rating is item 7.7 on "regular monitoring and evaluation of the impact of start-ups and enterprise support", with a mean score of 2.32; 55 per cent of respondents found it inadequate. The next-lowest is for item 7.10 regarding the engagement of both "internal and external stakeholders to review the university's entrepreneurial agenda and outcomes", with 55 per cent of respondents finding it inadequate and a mean score of 2.36. Individual comments also suggest that impact measurement and monitoring mechanisms were largely non-existent or not clearly established.

Opinions of respondents in Ghana were mixed in terms of the different aspects associated with this area. The areas with lower ratings appear to be item 7.9 about publishing and sharing impact results with stakeholders (mean score 3.13), item 7.8 about the measurement of the impact of entrepreneurial initiatives and programmes in the community and region (mean score 3.16); and item 7.2 on measuring the impact of entrepreneurial strategy on the entrepreneurship development of staff and students (mean score 3.39). Nonetheless, individual comments by respondents show that specific mechanisms, including the engagement of stakeholders in evaluating entrepreneurial outcomes, community impact assessment and publications on entrepreneurial outcomes, such as the number of start-ups, are emerging, or are at the infancy stage and are partially developed.

Figure 1.21
Item rating in the area of impact measurement
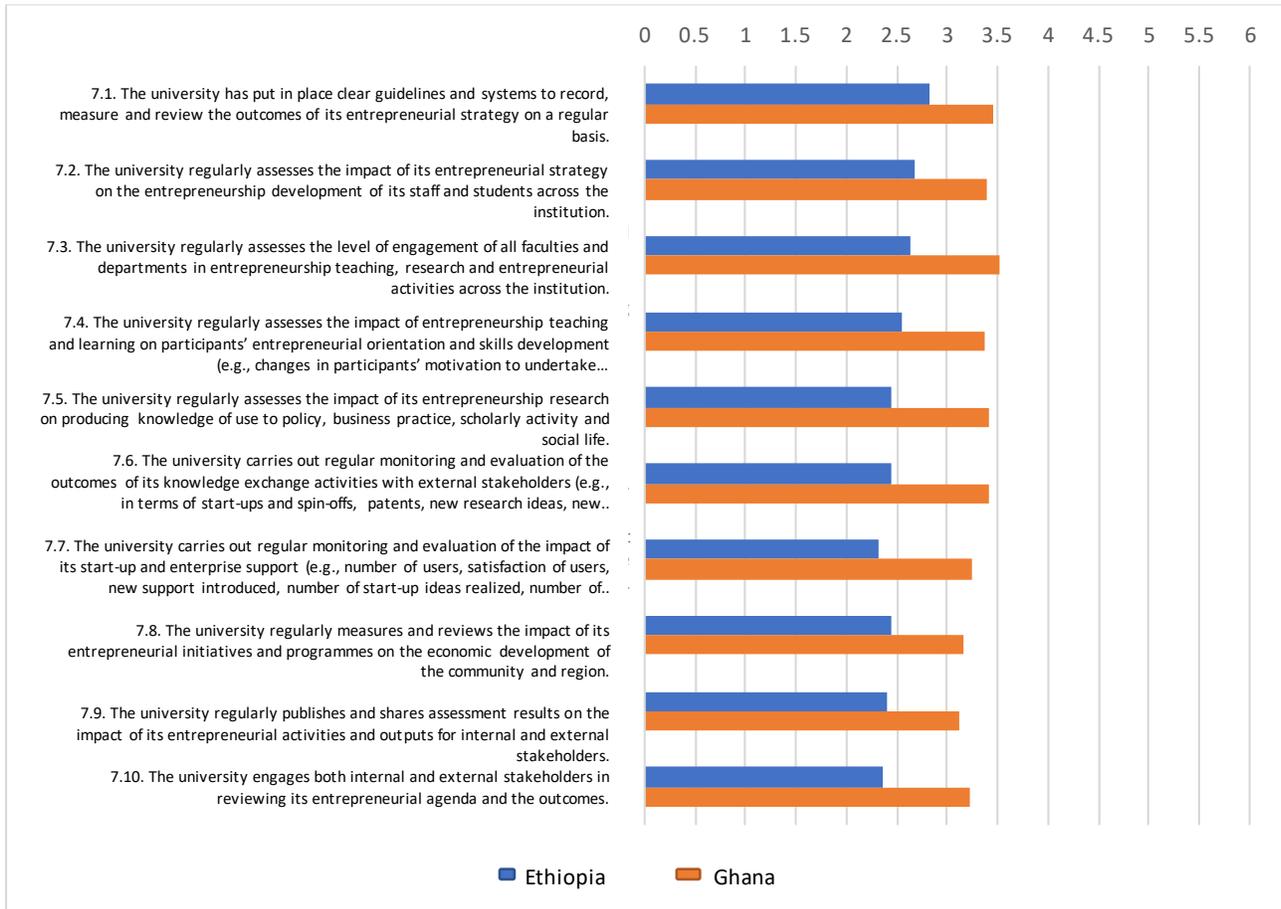
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

3.10 Budget allocation and funding sources for entrepreneurial strategies

3.10.1 Budget allocation

In terms of budget allocation for specific areas in support of the entrepreneurial strategy of the university, in relation to each of the pre-defined areas on the questionnaire, respondents were asked to indicate: "(1) Yes, it has grown"; "(2) No, it has not grown"; "(3) No specific budget for the area"; or "(4) No info/not sure".

As shown in figure 1.22, fewer than half of the respondents in either country indicated that budget allocation has grown in any of the six areas surveyed. Comparatively, budget growth was reported in more areas in Ghana than in Ethiopia, with the exception of the budget for the entrepreneurial skills training and development of staff, for which a greater number of respondents in Ethiopia (36 per cent) indicated budget growth. In Ghana, the growth of the budget for internationalization activities was reported by the highest number of respondents, which appears to be aligned with the rating in this area (4.59), which was higher than in the other six areas of the survey. The same applies to budget growth of knowledge exchange and engagement activities and

the relatively high rating in this particular area (4.26) by respondents in Ghana, as reported in section 4.1.

Breaking down data by the four responses in each country reveals further information for interpretation. In Ethiopia, respondents reported that there was no separate budget for a number of areas; it is therefore difficult to clearly indicate whether there had been a budget increase in specific areas (see figure 1.23). In Ghana, quite a significant proportion of respondents indicated that they had either no information or were not sure. In both cases, the results may indicate that greater attention should be paid to aligning budgeting practices with the transformation to entrepreneurial universities and better communication of relevant budget information (see figure 1.24).

Figure 1.22
Budget allocation for specific areas of the entrepreneurial strategy
(Percentage)
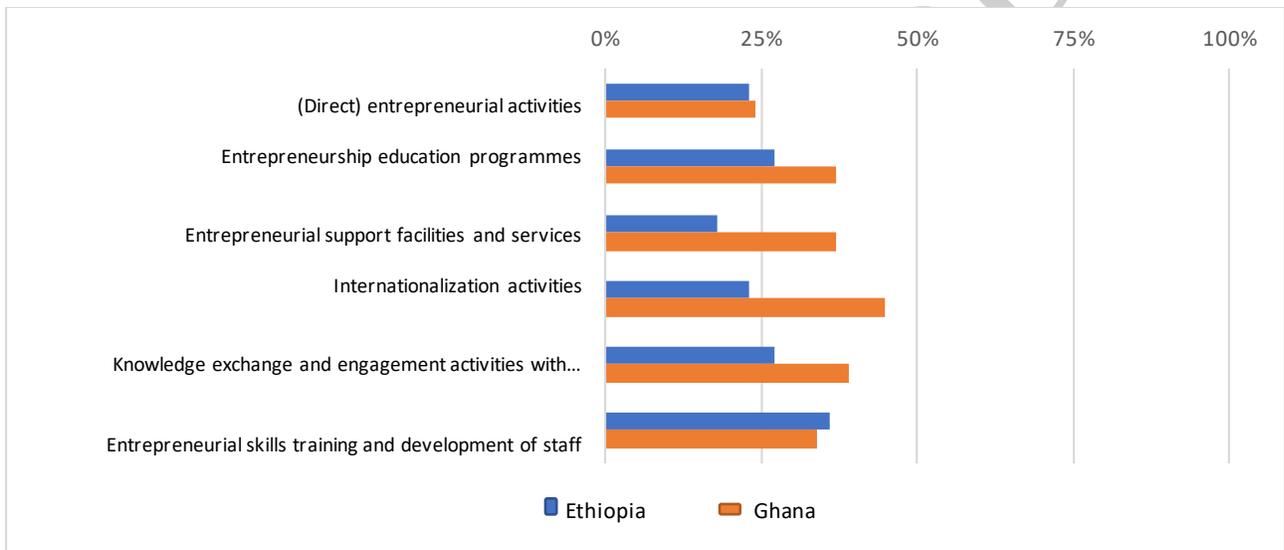
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.

Figure 1.23
Budget allocation for specific aspects of entrepreneurial strategies: Ethiopia
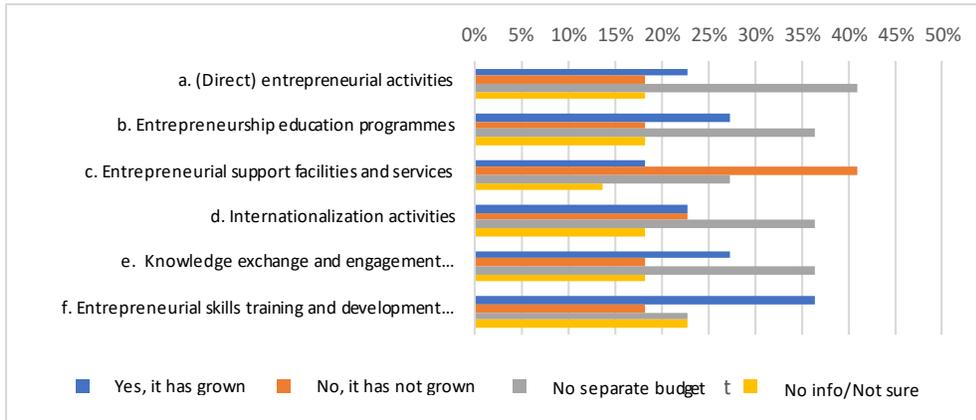
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

Figure 1.24
Budget allocation for specific aspects of entrepreneurial strategies: Ghana
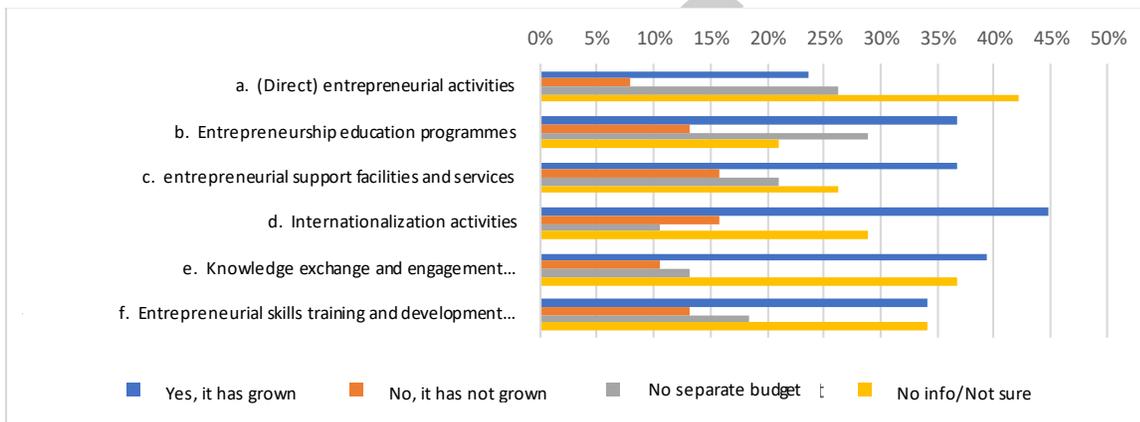
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

3.11 Funding sources for entrepreneurial strategies

Based on the survey data, more respondents in Ghana than in Ethiopia reported growth in funding from all the specified sources for the entrepreneurial strategy of their universities in the past three years (see figure 1.25). Specifically, close to 30 per cent of respondents in Ghana indicated growth in both domestic and foreign public funding, as well as in foreign private funding. In Ethiopia, close to 20 per cent of respondents reported that domestic public funding had increased in the past three years, while none reported an increase in domestic private funding. The result may suggest that public funding is still the primary source for universities in African countries.

Breaking down the responses into the four choices ("Yes, it has grown"; "No, it has not grown"; "No specific budget for the area"; or "No info/not sure") in each country (see figures 1.26 and 1.27) shows that a majority of respondents did not have information and were not sure about

the sources of funding. Nonetheless, the general picture is that funding sources for entrepreneurial strategy in universities in Ethiopia were more limited than those in Ghana.

Given that funding sources often vary greatly by discipline, responses were also broken down by discipline – in terms of social sciences and sciences – by each country. In Ethiopia, quite a high number of respondents (27 per cent) in science disciplines reported a growth in public funding from both domestic and foreign sources in the past three years. More respondents in social science disciplines saw an increase in funding from charities or trusts, while none of the respondents in sciences reported an increase in such funding. See figure 1.28 for details.

In Ghana, the survey results show a very different picture. More respondents in social science disciplines reported an increase in all funding sources than those in science disciplines. The funding source for which the highest number of social science respondents reported an increase was domestic public funding (40 per cent), followed by foreign public funding (35 per cent), foreign private funding (35 per cent) and charity or trust funding (35 per cent). Regarding science respondents in Ghana, the highest number of respondents reported an increase in funding from reinvestment of the university's entrepreneurial incomes (22 per cent) and foreign public and foreign private funding (both 22 per cent). For details, see figure 1.29.

Figure 1.25
Funding sources for entrepreneurial strategies
(Percentage)
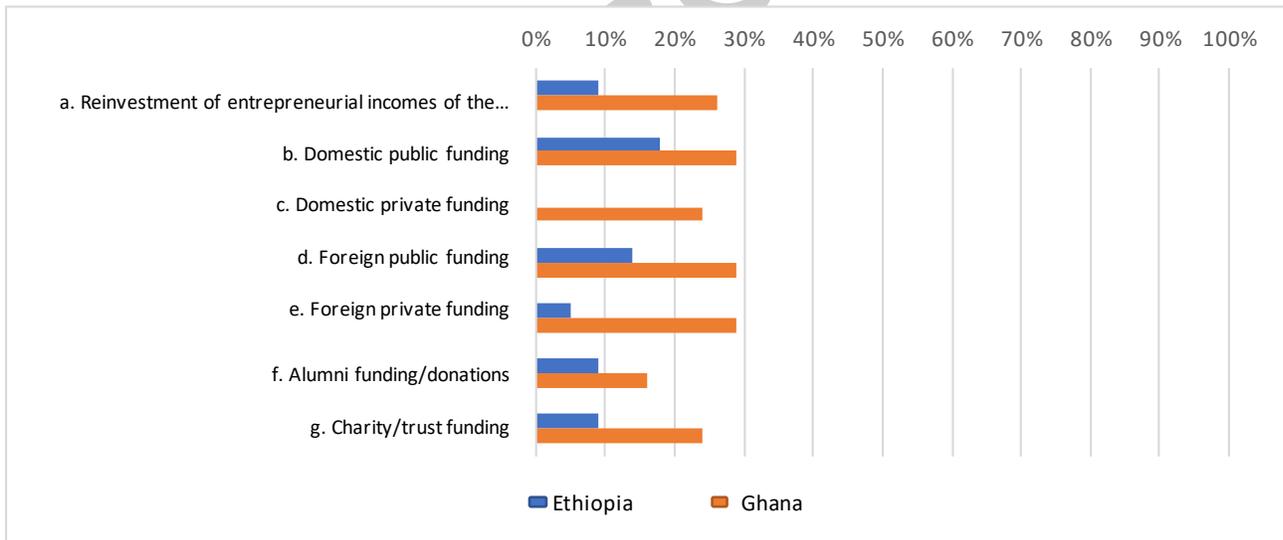
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

Figure 1.26
Funding sources for entrepreneurial strategies: Ethiopia
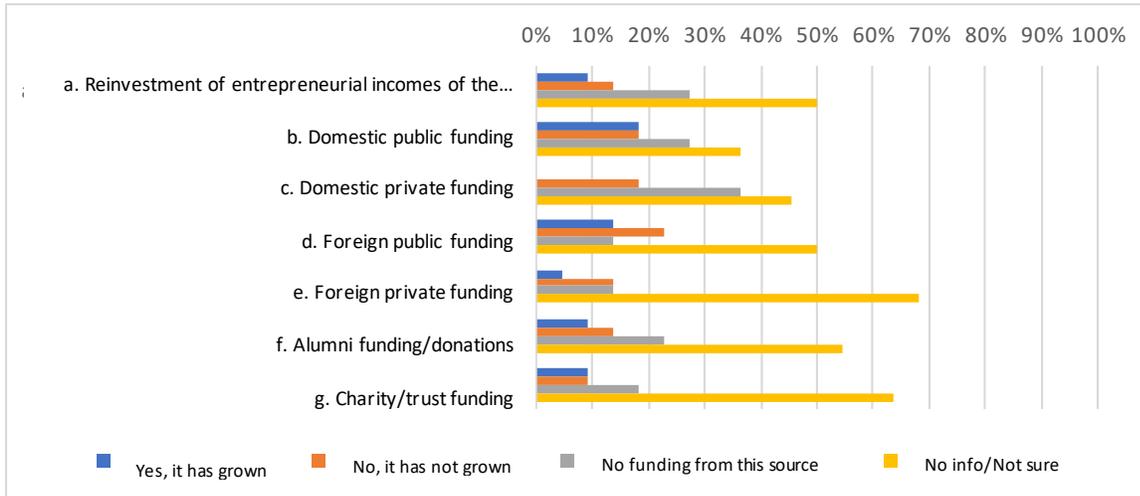
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

Figure 1.27
Funding sources for entrepreneurial strategies: Ghana
(Percentage)
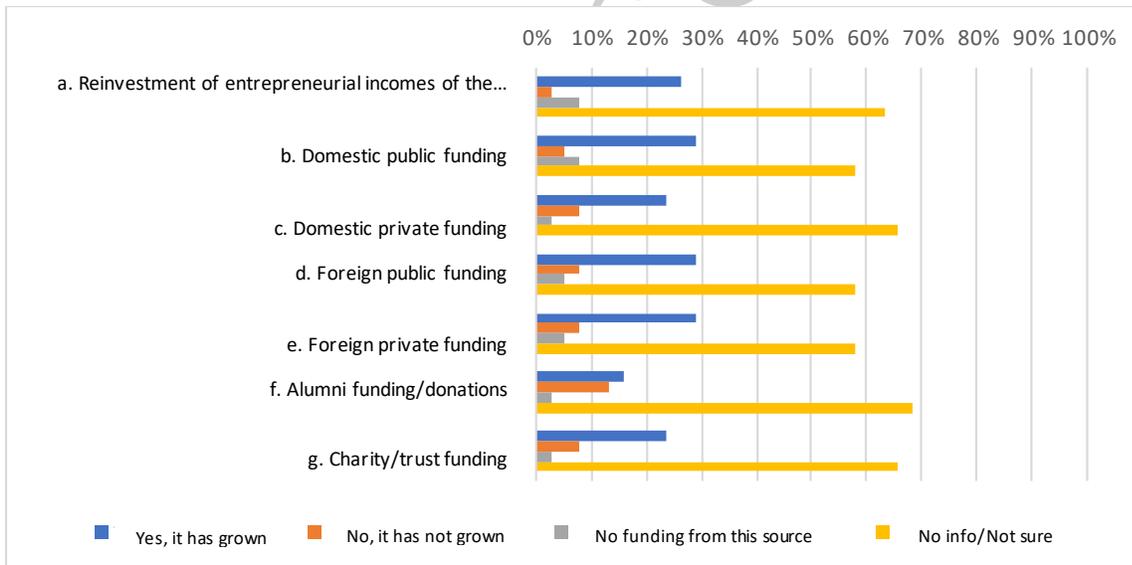
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

Figure 1.28
Funding sources for entrepreneurial strategies: Ethiopia, by discipline
(Percentage)
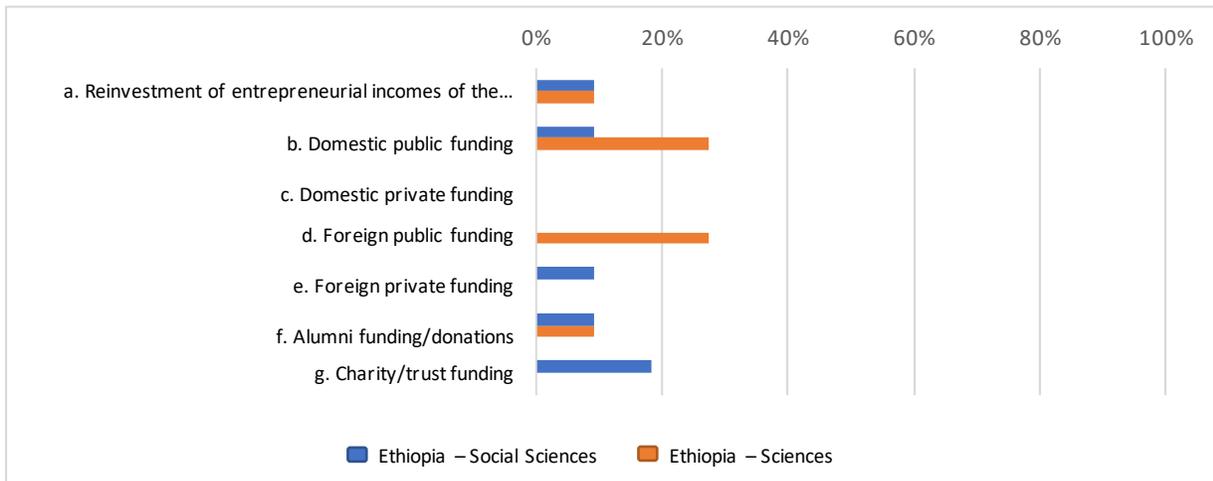
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

Figure 1.29
Funding sources for entrepreneurial strategies: Ghana, by discipline
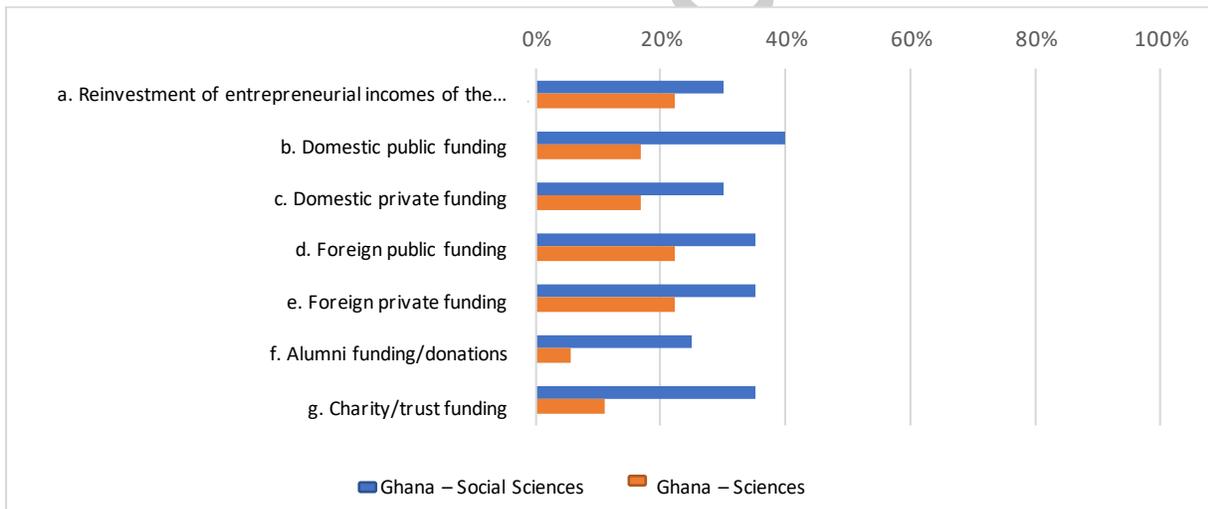
Source: United Nations, ECA, Advancing entrepreneurial universities in Africa survey, 2021.
Note: Data refer to the period 2018–2020.

4.   Discussion and implications

In general, the development of entrepreneurial universities in both countries could be considered to be in its infancy. However, some elements to be expected in entrepreneurial universities are seen in the published national policies for the tertiary or higher education sectors, as well as the in the institutional missions and strategies of the universities surveyed. One could therefore say that the intention to enhance the relevance, competitiveness and societal impact of the tertiary or higher education sector is present, but that the survey results suggest that the actual

development and implementation of entrepreneurial activities within higher education institutions are yet to be enhanced.

4.1   National policy direction

Widening access to higher education and improving its equality and inclusion remain the top priority of the policy directives of the two countries, in particular those related to the first mission (i.e., teaching) of universities. This is understandable when considering that the tertiary education enrolment rate of the two countries – 8 per cent (2014) in Ethiopia and 17 per cent (2019) in Ghana – is far below the global average, which reached 38.85 per cent in 2019. The female enrolment rate in tertiary education is also extremely low at only 5.2 per cent (2012) in Ethiopia and 15.8 per cent (2019) in Ghana, compared with the global average of 41.7 per cent (2019).

With the aim of improving the quality of teaching and the diversity of curricula to enhance the employability of graduates, there are explicit statements in the recent strategic education plans of both countries that highlight: the importance and relevance of entrepreneurial skills as attributes that increase employability in view of current human capital needs;[8] and education in science, technology, engineering and mathematics to disseminate core knowledge and implement innovations that contribute to supporting national and community development priorities. The strong emphasis placed on education in science, technology, engineering and mathematics corresponds to the Continental Education Strategy for Africa 2016–2025 of the African Union, which is intended to "strengthen the science and math curricula and disseminate scientific knowledge and the culture of science in the African society" as a key objective, and to the Science, Technology and Innovation Strategy for Africa 2024 of the African Union, which places science, technology and innovation at the heart of the continent's socioeconomic development and growth in a knowledge-based economy.

Similarly, there is also a clear policy mandate to orientate and incentivize university research in line with national priority areas. The Education Strategic Plan 2018–2030 of Ghana, for example, specifies the need to "determine national priority research areas and provide adequate and sustained funding for research infrastructure, human resources for research, and research activities" as a strategy to improve higher education research and postgraduate training (Ghana, Ministry of Education, n.d., p. 59). In Ethiopia, in the Education Sector Development Programme 2015–2020, an important goal of higher education is "to produce research which promotes knowledge and technology transfer based on national development and community needs". Undertaking study, research and community services in relation to the national and local priority areas is further elaborated in the 2019 revision of the Higher Education Proclamation of Ethiopia as a main duty and responsibility of higher education institutions. Accordingly, knowledge and technology transfer, as well as collaboration with industry, other national and foreign institutions and research centres in joint academic and research projects, are emphasized. In Ethiopia, the promotion of linkages between universities and industry and other research institutes and

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[8] In Ghana, for example, an action plan formulated after a national summit in 2016 on tertiary education, *Crafting a National Vision and Plan for the 21st Century for Higher Education in Ghana*, articulated a vision for the twenty-first century with a focus on fostering an entrepreneurial and internationally competitive nation. In the Education Sector Development Programme 2015–2020 of Ethiopia, entrepreneurial skills are mainly positioned under the technical, vocational education and training curriculum, an area that is separate from tertiary education.

stakeholders in the national innovation system is incorporated into the country's science, technology and innovation policy with a dedicated university-industry linkage directive.

From this perspective, the tertiary and higher education policies of the two countries channel a vision to connect the conventional teaching and research missions of tertiary and higher education institutions with the emerging third mission: the direct impact of higher education institutions' teaching and research outcomes on local, national and even regional socio economic development. However, specifics about the role of higher education institutions and universities as key entrepreneurial actors in society and their entrepreneurial activities within and beyond the institutions themselves are still largely missing or are not clearly elucidated. Furthermore, specific higher education policies, rules, regulations and other management and monitoring systems also may not be synchronized with this vision or may not support it.

4.2   Institutional development

Regarding the leadership and governance, the mission statements of the universities sampled in Ethiopia and Ghana all encapsulate the national policy direction of higher education teaching, research and engagement with the local community in one way or another. However, several important observations are worth noting, as follows:

- The inconsistent responses among respondents from different levels and disciplines within the universities sampled suggest that the entrepreneurial elements in the institutional-level mission and strategic plan may not always be clear, recognized or interpreted consistently across the institution. A shared understanding of the higher-level mission and the respective goals for integrating entrepreneurship into the institutional system are yet to be established across different institutions in the two countries. This is fundamental to fostering a common goal and to laying down "a steering core" to enact the transformation (Clark, 1998).

- A particularly interesting observation is that a majority of respondents in both countries recognized the presence of essential central organizational mechanisms, such as a senior university-level leadership position, a central unit and specialized units for implementing entrepreneurial activities in their institutions. However, such recognition is not in sync with their recognition of the high-level commitment to implementing an entrepreneurial strategy. The misalignment is particularly vivid in the case of Ethiopia. Potential reasons may be that the actual roles and responsibilities of these organizational mechanisms are limited, unclear or ineffectively promoted among all parties, that capacity is low, that the coverage of support that they provide across the institution is narrow or uneven, that their functioning is inefficient or their achievements are unclear or not recognized, or simply that they are seen as irrelevant to entrepreneurial activities by individual respondents. The mere existence of these physical set-ups in the institution therefore does not help to signify a high-level commitment to implementing an entrepreneurial strategy across the university or anchor central initiatives to integrate and coordinate entrepreneurial activities at all levels. This understanding appears to be in line with Kabongo and Okpara's (2010) findings of the lack of a clear link between the promotion of entrepreneurial activities and the establishment of entrepreneurship centres in the higher education institutions in sub-Saharan Africa that they studied.

- The apparent lack of autonomy and empowerment for individual faculties, departments and other units at the operational level in pioneering entrepreneurial initiatives and undertaking entrepreneurial activities within the institution could be a major hindrance. Leading examples of entrepreneurial universities all value bottom-up initiatives and a highly decentralized approach to encourage responsive exploration and the pursuit of entrepreneurial opportunities (Clark, 2001; Duruflé, Hellmann and Wilson, 2018). A sense of autonomy and empowerment is essential to creating an entrepreneurship system within the university and promoting collegiality (Gümüsay and Bohné, 2018). Limiting autonomy and adopting an overly centralized approach, on the other hand, will stifle the proactivity, flexibility, creativity and diversity of individual entities, and suppress the entrepreneurial spirit and culture.

- In the case of Ethiopia, for example, the Higher Education Proclamation includes statements about granting the necessary autonomy to public higher education institutions in pursuit of their mission, as well as to academic units within these institutions in administration, finance and academic affairs. However, despite these high-level statements and the continuous reform of the national higher education sector, it is suggested that the decision-making concerning most issues relating to academia (e.g., design of education programmes and curricula), finance (e.g., allocation of public funding and even the self-generating income of universities) and administration is still highly centralized by the Government directly through the respective ministries or indirectly through university boards that have members appointed by ministries (Mudde, Gerba and Chekol, 2015; Gebremeskel and Feleke, 2016; Boateng, 2020). Sall and Oanda (2014) commented that government-led management of higher education institutions may undermine the real governance autonomy needed to revitalize those institutions and realize their missions, as the interests and voices of other key stakeholders (e.g., faculty, students, the private sector and local individuals) are often sidestepped by those with political agendas. The survey results in Ethiopia show that those who hold departmental leadership and management positions may have different and positive opinions of all seven areas assessed compared with general academic staff. The demarcation between the high-level management boards of universities and staff at the operational level may be even more distinct, as observed in previous studies on higher education in the country (see, for example, Tessema, 2009; Gebremeskel and Feleke, 2016; Melu, 2016).

In terms of organization, capacity and incentives, the survey results revealed three main areas of interest in both countries: the resources and support available for entrepreneurial activities were not adequate, in particular for female staff and external partners; the existing performance appraisal system did not take entrepreneurial performance and outcomes into consideration in the same way as teaching and research, and the lack of recognition and incentives for, and investment in, entrepreneurial activities in the appraisal of staff performance and development is likely to demotivate and discourage staff from focusing on or prioritizing such activities, in particular among the other work assignments (e.g., teaching and research outputs) that are conventionally appraised and recognized; and support and incentives for interdisciplinary entrepreneurial activities across the institution were also found to be inadequate, which could present another barrier to achieving collegiality and a shared entrepreneurial culture within the institution.

These inadequacies observed in the implementation of entrepreneurship and entrepreneurial activities at the operational level could, to a certain extent, cast doubt on high-level commitment to the entrepreneurial strategy. However, it is worth noting that more than one third of respondents in each of the countries mentioned that the budget allocated for entrepreneurship skills training and development of staff had increased in the past three years.

Referring to areas 3, 4, 5 and 6 of the Guiding Framework, the survey results suggest that certain roles and activities related to the development of entrepreneurial universities were better recognized and accepted as adequate by respondents in the institutions sampled in the two countries. The results support the notion that universities could enact their entrepreneurial transformation through heterogeneous focuses or pathways. Nonetheless, the relatively high rating in the two specific areas (5 and 6) of activity (external knowledge and technology transfer, and internationalization) could be explained by the fact that they are already inherent to the conventional academic missions of teaching and research. Activities related to these two areas may therefore not necessarily be understood as or related to entrepreneurial strategy or academic entrepreneurship by respondents. In the area of external knowledge and technology transfer, specifically, it is interesting to note that most respondents found the system for external parties to exploit a university's intellectual property to be inadequate, which raises the question of which particular university knowledge and technology are transferred in practice and how that occurs, to enable entrepreneurial actions and create a societal impact. Answers to this question are needed in order to understand and validate the high rating of this particular item.

The other two areas in the Guiding Framework (3 and 4: entrepreneurship development in teaching and learning, and pathways for entrepreneurs) could be regarded as a clearer manifestation of the entrepreneurial roles and activities of a university. However, the relatively low respondent rating for these two areas indicates they were less well developed. Entrepreneurship education is considered to be fundamental to the development of an entrepreneurial mindset, behaviour and skills that drive the growth of effective entrepreneurship to catalyse business growth and employment and, as a result, socioeconomic development (Robb, Valerio and Parton, 2014; Sam and van der Sijde, 2014). However, it is a relatively new area in the higher education sector in Africa (Kabongo and Okpara, 2010; Nyadu-Addo and Mensah, 2018), and understanding of progress in its development in the two focal countries remains limited (Mudde, Gerba and Chekol, 2015; Dzisi and Odoom, 2017).

As mentioned above, the national higher education policy of both Ethiopia and Ghana primarily refers to entrepreneurship education as part of technical and vocational education and training, for example, something to be delivered in polytechnic institutions, rather than a mainstream academic discipline in traditional public universities. It is mentioned that entrepreneurship education is not mandated for higher education institutions in Ghana (Nyadu-Addo and Mensah, 2018). Even if it is delivered in traditional public universities, it is generally not considered to be a core subject, has a narrow curriculum and simply follows a traditional pedagogical approach that is ill suited to its nature and expected learning outcomes (Bawakyillenuo and others, 2013; Dzisi and Odoom, 2017).

In Ethiopia, a more systematic programme for entrepreneurship training for public university teaching staff was spearheaded only after a national entrepreneurship development centre was established in 2013; the development of entrepreneurship education in Ethiopia is

therefore in its infancy (Mudde, Gerba and Chekol, 2015). The extremely low rating in this area by Ethiopian respondents in the survey is in congruence with the findings of previous studies, which highlight shortcomings in terms of the limited training and development of staff and, as a result, a low capacity to design and deliver an entrepreneurship curriculum, no incorporation of innovative and experiential-based teaching and learning approaches into entrepreneurship, and limited engagement with practitioners to enhance the quality and relevance of entrepreneurship teaching, learning and research (Gerba, 2012; Kannan, 2012; Mudde and others, 2019). Mudde, Gerba and Chekol (2015) also pointed to the strict policy of nationwide harmonization of degree curricula as restricting the development of entrepreneurship education in the country because the emphasis on uniformity runs counter to the essence of entrepreneurship education, which is aimed at cultivating an entrepreneurial spirit and behaviours that can exemplify creativity, innovation and diversity. However, the results, which show that one fourth of respondents in Ethiopia and one third in Ghana suggested that the budget allocated for entrepreneurship education programmes had increased in the past three years, may indicate increased efforts in this area.

Pathways for entrepreneurs, be they students or staff, are shown in both countries' survey results as insufficiently developed, in general. The commercialization of research outputs and innovations, the promotion of business start-ups and academic spin-offs, and incubation were not recognized by a significant proportion of respondents in either country as part of the mission statements or implementation plans of their institutions. Although access to incubation facilities appear to have received a relatively high rating, other critical support and resources, including access to finance and investment, training, mentoring, intellectual property protection and commercialization systems were indicated to be mostly lacking. Interpreted together with the above-mentioned high rating of the external knowledge and technology transfer (area 5 of the Guiding Framework), shortcomings in this particular area cast doubt on the extent to which the respective research and knowledge outputs produced by universities could actually be transferred and applied as practical solutions and services that have a direct impact on their communities.

The particularly low rating of impact measurement (area 7 of the Guiding Framework) in both countries is perhaps another clear indication of the inadequate and unclear integration of entrepreneurial strategy and related activities into the university system. The lack of clear measurement and assessment systems was found across all entrepreneurial roles and activities included in the survey, regardless of whether they were linked to teaching, research or external engagement (with the community or external stakeholders).

It is surprising to find that, while community engagement forms a main part of the mission of all sampled institutions and its implementation was recognized by a significant number of respondents, this aspect received the lowest rating in terms of impact measurement. That means that respondents may know that they should undertake activities to engage with and contribute to the community; however, they may have little idea of whether such activities create the expected outcomes and impact. This situation perhaps echoes what Sam and van der Sijde (2014, p. 901) emphasized, that "performing entrepreneurial activities does not automatically transform a university into an entrepreneurial university, only when the entrepreneurial activities create added value for education and research and vice versa". The lack of monitoring, measurement and assessment mechanisms makes it difficult, if not impossible, for the institution and its staff to trace and review the effectiveness of resource allocation, the design and delivery of activities and

services, and the actual performance of their endeavours to pinpoint key areas for adjustment and improvement. It is therefore not possible to demonstrate any direct or relevant change or impact made to societal development, which is the overarching goal of entrepreneurial universities. In this regard, making sure that a comprehensive reporting, monitoring and evaluation system is developed and functional is an area that demands the immediate attention of both countries.

4.3 Implications

4.3.1 Implications for policy

In respect of the national measures to advance entrepreneurial universities, policy makers need to accept that the promotion of entrepreneurship through education is important to competitiveness and improvements in living conditions. Governments can ensure that the new sets of universities being designed and developed are entrepreneurial in nature and that expansions of existing universities include or broaden the entrepreneurial mission at the core of their systems. This should not be tied only to the generation of additional income for the university but rather to broad aspects, such as driving growth in research, innovation and entrepreneurship in areas of national importance, including agriculture, mining, health, transport, infrastructure, water and sanitation.

Decentralizing the education system both in terms of ownership and configuration may be another area of importance. Entrepreneurship, by its nature, requires institutions to have the necessary freedoms to combine existing knowledge and systems in unusual or new ways to deliver value to clients and communities, in general. Academic entrepreneurship seems to flourish in countries with diverse configurations of universities, ownership and diversity in teaching and research. Universities may choose their students, researchers and partners differently, and experiment with different course and research offerings that then generate the knowledge and talent capable of driving change, meaning interaction with external and internal partners. Efforts to harmonize every aspect of education may work against driving entrepreneurship, as they are mostly focused on teaching and rarely on research, and they do not take the entrepreneurial attributes of the university into consideration.

The development of infrastructure to support entrepreneurial activities can go a long way in ensuring that policy measures have support on the ground. Such infrastructure commonly includes technology transfer offices, incubation centres, innovation hubs, technology parks and accelerator programmes. Policymakers may also wish to encourage the establishment of joint research and development centres, policy research institutions and knowledge-intensive joint ventures with the private sector that are located close to or inside universities. In the same vein, a private institute or corporation in an area of interest could be supported to host a teaching, research and entrepreneurship programme. Nothing stops a government from developing an institute with a telecommunications company, bank, airline or food producer to quickly build the capacity needed, in the same way that hospitals and agricultural centres host training and research units. This approach solves the problem of how to build linkages between academia and industry, and it brings academic and entrepreneurial talents together for joint work.

Most policymakers seem to focus on natural and applied sciences as the areas in which entrepreneurial activities need to be scaled up. This is understandable, but entrepreneurship flourishes when teams from different backgrounds work together. More importantly,

entrepreneurship is needed in all fields to design innovative tools and systems in all sectors, and it may even drive innovation in technology. It is design that forces engineers and technologists to innovate in order to work within the limits dictated by the design, for example, of a mobile phone, house or computer. Universities are the perfect places for the arts and sciences to interact to solve complex challenges. Shared facilities and interdisciplinary centres (e.g., the Internet and society, media labs and design kitchens) can help to drive such change.

Funding is another important tool that governments can use to drive change. While innovation funds have become popular, it is research funding that seems to be important in some countries. As noted earlier, a stimulated and fertile research environment is needed within the university to anchor knowledge transfers, attract partnerships and drive entrepreneurial activities. As governments are likely to remain the main funding source for research and development, both the funding models and regulatory tools could be designed to include clearer technology ownership rights for research and development outputs from publicly funded research and to ensure the relevance of the type of research funded. At the institutional level, the survey calls on university leaders to seek ways to ensure that the entrepreneurial strategies and missions of their universities are broadly communicated, assessed and appraised, and that changes made to enable the outcomes of entrepreneurial activities are appreciated and understood by all. In time, this could lead to the university having a shared goal that is needed to enact the transformation (Clark, 1998). Some of these changes may include ensuring that central organizational mechanisms, such as a senior university-level leadership position, a central unit and specialized units for implementing entrepreneurial activities in their institutions, are discussed and marketed.

4.3.2 Implications for universities

The management of universities may also wish to empower faculties, departments and other units to pioneer entrepreneurial initiatives and undertake entrepreneurial activities within the institutional norms, but with the freedom to act quickly as entrepreneurial windows open and close. A decentralized approach to encourage responsive exploration and the pursuit of entrepreneurial opportunities (Clark, 2001; Duruflé, Hellmann and Wilson, 2018) is essential to creating a system within the university that promotes responsibility and ownership of successes and failures (Gümüsay and Bohné, 2018). By so doing, institutions could fairly recognize and incentivize staff to undertake entrepreneurial activities in the same way as those that teach and carry out research.

Partnerships and external funding for research are well established in African universities but partnerships to support the entrepreneurial mission of the university are relatively new. Universities should pursue external knowledge and partnerships with top universities, private firms and other entities that have a strong record in promoting and developing entrepreneurship, including to access technology beyond that which is already available to them.

Universities have all the manpower needed to undertake impact assessments of their investments in entrepreneurial activities. From postgraduate students to their own researchers, and from technology transfers to commercialization units, universities could leverage their own resources to conduct research on the outcomes and contributions of their activities at a minimal cost. Such research is important in informing both the leadership and operational units and partners of the performance of their work and in making the necessary adjustments.

PART II: FINDINGS OF NATIONAL CASES

CHAPTER 2. ADVANCING ENTREPRENEURIAL UNIVERSITIES IN ETHIOPIA

Executive summary

Transforming the economy of Ethiopia and enhancing national competitiveness requires that entrepreneurship be fostered. It is becoming increasingly evident that a system that consists of institutions, entrepreneurial organizations and entrepreneurial processes is necessary for the growth of entrepreneurship. Universities as knowledge generators can play a key role in such a system through their linkages and interactions with different organizational stakeholders. However, there is a lack of sufficient information about the entrepreneurial activities of Ethiopian universities and their interaction with the different actors in the innovation and entrepreneurship system. The present study was, therefore, aimed at reviewing government policies and strategies that have an impact on university entrepreneurship, assessing the strategies and practices of entrepreneurial universities in Ethiopia in supporting entrepreneurship, and identifying the way forward so as to further strengthen the development of entrepreneurship.

Eight first-generation universities in Ethiopia, which were established in the early 2000s and before, were considered as potential candidates for the case study. These universities have larger student populations and better qualified academic staff, carry out more research and have wider involvement in community services than the universities established in subsequent years. A desk review was undertaken to select cases among these first-generation universities for inclusion in the study. After considering a number of factors that may be relevant to entrepreneurship, three universities were selected for an in-depth study. These were Addis Ababa University, Haramaya University and Bahir Dar University.

The assessment was carried out on the basis of the following seven characteristics of an entrepreneurial university: leadership and governance; organizational capacity: funding, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university.

Many of the objectives and strategic themes contained in the strategies of the three universities surveyed constitute elements of university entrepreneurship. There is also some evidence reflecting a commitment by the leadership of the universities to advancing their entrepreneurial agendas. Furthermore, the universities took the initiative to establish entrepreneurship centres and other units within their organizational structures to promote entrepreneurship within their institutions. However, many academic staff who responded to the survey questionnaire are of the opinion that entrepreneurship has not been clearly included as a major part of the universities' strategies. Furthermore, a good number of them think that there is an

absence of commitment among the leadership to implementing the entrepreneurial strategies of their universities. Similarly, the information obtained from the respondents indicates that there is a lack of university autonomy to act on the entrepreneurial initiatives.

Higher education institutes in Ethiopia obtain a significant share of their financing from the Government, complemented by a small amount of funding obtained from foreign donors and internal revenue-generating activities. The study revealed that this heavy dependence on government financing significantly constrained the entrepreneurial endeavours of the universities. Most of the respondents also indicated that their universities lack sustainable financial strategies to support the entrepreneurial agendas. The absence of mechanisms and channels to bring internal stakeholders together to foster their involvement and relationships, in line with the entrepreneurial agendas of the universities surveyed, is also seen in the responses of academics.

The failure of the universities to involve industry professionals with entrepreneurial experience and attitudes in teaching and inadequate investment in staff development to support the entrepreneurial agenda are also reflected in the survey responses. In the area of staff incentives and rewards for entrepreneurial contributions, although there are some encouraging developments, the respondents believe that the current practices in universities are far from adequate. In the same way, despite the adoption of policies and the creation of gender offices in universities, there are still challenges in promoting the valuable entrepreneurial skills and knowledge of female academics.

Innovative teaching and learning that enables the development of an entrepreneurial mindset does not seem to have received adequate attention in the universities surveyed. In these universities, competences are not well identified, the organization of modules is weak and the teaching methods are dominated by the traditional lecture method, with less emphasis on the world of work. As a result, the current programmes offered at Ethiopian universities are weak in terms of the provision of entrepreneurial skills to students. The concept of entrepreneurship in the academic context, which can be applied to a wide range of contexts, is also not properly addressed in the various awareness-raising programmes organized by universities. Furthermore, these events are not organized regularly and they mostly take place through individual initiatives rather than as institutionalized and planned activities.

The universities that participated in the survey have poor performance records in establishing links with different actors in the various socioeconomic sectors. There is a disconnect between the activities of universities and the private sector, and universities have limited interaction with public industries. This has had a negative impact on the quality of education, with most teaching at the universities remaining mainly textbook-based, with little infusion of local practical knowledge and experiences.

The issue of intellectual property protection for university-generated knowledge is addressed by the Higher Education Proclamation of 2019. The senate legislation for the three universities incorporates sections that address the ownership of intellectual property rights. The provisions in the legislation include university ownership of intellectual property rights, the rights of the intellectual property owners concerning the publication of research results, the use of the scientific data obtained and the ownership of intellectual property in contract research.

A review of the documents produced by the universities surveyed showed that they included internationalization in their strategies, which was focused on joint academic programmes, research collaborations, publications in international journals and the hosting of international

workshops and conferences. In the views of the majority of the survey participants, the institutions are also involved in some initiatives with an international perspective. However, the extent to which these initiatives incorporate entrepreneurial features is not clear.

The absence or weakness of mechanisms to measure the impact of entrepreneurship in universities is clearly stated by the respondents. It can be seen from the answers that the systems put in place to monitor and evaluate the universities' planned activities are not utilized to measure the impact of their entrepreneurial activities.

The evidence presented in the present study shows that the higher education system in Ethiopia has to become more entrepreneurial to support the economic, social and cultural development of the country. Taking into consideration this close link between university entrepreneurship and development, the following recommendations are provided to Ethiopian policymakers and university leaders: adopt a broader view on entrepreneurship; promote interdisciplinary programmes; grant more autonomy to universities; introduce measures to bridge the gender gap in academic entrepreneurship; revisit the criteria for academic promotion and recognition; give more attention to knowledge exchanges and collaboration with external organizations; and introduce performance-based funding mechanisms.

1.   Introduction

In order to transform the Ethiopian economy and enhance national competitiveness, entrepreneurship must be fostered. It is becoming increasingly evident that a system that consists of institutions, entrepreneurial organizations and entrepreneurial processes is necessary for the growth of entrepreneurship. Universities, as knowledge generators, can play an important role through their linkages and interactions with different organizational stakeholders in such a system. However, little knowledge exists on the current level of integration of entrepreneurial activities in Ethiopian universities and their contributions to innovation and change. The primary objective of the present study was, therefore, to assess the strategies and practices of entrepreneurial universities in Ethiopia in supporting entrepreneurship, as well as the government policy context, and to identify the way forward to further strengthen the development of entrepreneurship.

The methodology used in the present review is based on the work undertaken by the European Commission and OECD, which led to the development of *A Guiding Framework for Entrepreneurial Universities*. The Guiding Framework has the purpose of helping universities to identify their current situation and potential areas of action, taking into account their local and national environments. It also helps to determine the strengths and weaknesses of universities and find ways forward.

Eight first-generation universities in Ethiopia, which were established in the early 2000s and the period before that, were considered as potential candidates for the case study. These universities have larger student populations and better qualified academic staff, carry out more research and have wider involvement in community services than the universities established in subsequent years. A desk review was undertaken to select cases among these first-generation universities for inclusion in the study. After considering a number of factors that may be relevant to entrepreneurship, three universities were selected for an in-depth study. These were Addis Ababa University, Haramaya University and Bahir Dar University.

A desk review was conducted to study and analyse the literature on the main concepts of entrepreneurship in the context of universities. The review also consisted of analysing national policies and laws in Ethiopia that have impacts on university entrepreneurship. The institutional policies, strategies and guidelines of the universities were also analysed to determine their entrepreneurial orientation.

A questionnaire developed by the Economic Commission for Africa (ECA) was used to collect information that was subsequently used as data for analysis. The questionnaire looks at seven key areas: leadership and governance; organizational capacity: funding, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university.

The purposive sampling technique was used to select academics who could provide the required information owing to their knowledge or experience in the area under investigation. A total of 41 university staff, whose current roles include strategic planning and decision-making or who had active roles in the past in these areas, received email invitations. The email invitations contained information about the study and a link to Google Forms, where the questions were available. The total number of responses was 20, of which 8 were from Addis Ababa University and 6 each were from Haramaya and Bahir Dar Universities. The response rate was 49 per cent.

2. Overview of the higher education system in Ethiopia

2.1 Key actors and elements of the Ethiopian higher education system

2.1.1 Higher education institutes

Secular higher education was introduced in Ethiopia in 1950 with the founding of the University College of Addis Ababa. In 1962, the University College was upgraded and renamed Haile Selassie I University, which, in 1975, changed its name to Addis Ababa University. In 1985, Alemaya Agricultural College, one of the colleges under Addis Ababa University, was upgraded to become Alemaya University, which is now Haramaya University. Until the late 1990s, the Ethiopian higher education system was comprised of only these two universities. The system started to expand at the turn of the century with the founding of new public universities and the appearance of the private sector on the higher education scene. There are currently 46 public universities and a further 94 private colleges and university colleges engaged in higher-level human development endeavours across the country.

The extra capacity created as a result of the expansion has allowed rapid increases in student intake. Undergraduate enrolment rose from 56,072 in 2003/04 to 788,033 in 2016/17, of which 281,429 (35.7 per cent) of the students were female. There has also been a constant increase in postgraduate programmes over the years. The number of postgraduate students, which was only 2,560 in 2003/04, reached 72,345 in 2016/17. The total percentage of female postgraduate students in 2017 (in both masters' and doctoral programmes) was only 17.8 per cent. For enrolments in doctoral programmes alone, the figure for female students was 8.7 per cent.

The number of academic staff has increased substantially, from a total of 20,822 in 2012 to 32,734 in 2017, which was a 57.2 per cent increase over a period of five years. A significant majority (30,631) of academic staff were employed by public higher education institutes. In the same year, the total number of academic staff of Ethiopian nationality was 30,835, of whom 28,761 were in government institutes. The share of female academic staff was 13.6 per cent, and 12.6 per cent were in government higher education institutes. Concerning expatriate staff, 216 (0.7 per cent) were women employed by public higher education institutes, except 5 who were in private higher education institutes. The qualification level of academic staff shows that 3,833 were PhD holders, while the number of staff with masters' and bachelors' degrees were 15,423 and 10,767, respectively. The remaining staff has an MD/DVM (1,965), specialty degree (484), subspecialty (56) or another qualification (206).

In 2009, the Government introduced a 70:30 undergraduate placement quota policy whereby 70 per cent of undergraduate students study hard sciences and technology and 30 per cent study social sciences. However, there were challenges associated with the implementation of the policy relating to the capacities of the universities and the absorptive capacity of the economy to give jobs to the graduates in science and technology fields. As a result, the education system was producing low-quality graduates and a significant level of graduate unemployment was registered. As a result, in 2019, the Government revised the student placement ratio and proposed a 55:45 student placement quota policy for natural sciences and technology and social sciences respectively.

Universities in Ethiopia are classified as research universities, applied science universities, comprehensive universities and specialized universities. Addis Ababa, Haramaya, Bahir Dar,

Jimma, Arba Minch, Gondar, Mekelle and Hawassa universities are categorized as research universities. The universities classified as specialized universities are Addis Ababa Science and Technology University, Adama Science and Technology University and the new Technical University. While 20 universities are included in the applied sciences group, the remaining 15 universities will continue to operate as comprehensive or general universities.

2.1.2 Ministries, agencies and institutes

Until 2018, the main government organ responsible for the leadership of higher education development in Ethiopia was the Ministry of Education. In 2018, following a restructuring of government offices, the Ministry of Science and Higher Education was established and took over the role of implementing national higher education policies and strategies. The Ministry is entrusted with the task of ensuring the preparation and delivery of curricula for higher education, in accordance with international developments and national demands and requirements. The powers and duties of the Ministry also include promoting the active involvement of a range of stakeholders in education, training, research, practicums, apprenticeships, research and technology transfer.

Another government organ that has responsibilities relating to fostering university entrepreneurship is the Ministry of Innovation and Technology, which was established in 2018. It is mandated with the tasks of preparing national innovation and technology research and development programmes and planning institutional capacity and human resources development for effective implementation of the programmes. The Ministry supports the capacity-building of institutions and professionals involved in innovation and technology activities and collaborates with relevant bodies to ensure that the country's educational curricula are designed in line with innovation and technology development. It also identifies new innovation and technology studies and research areas relevant to the country's development and coordinates national research programmes.

The Higher Education Relevance and Quality Agency, the Higher Education Strategy Centre and the Ethiopian Institute for Higher Education are also government institutes with mandates relating to the quality, planning and capacity-building of higher education institutes. The Agency encourages and assists in the growth of an organizational culture in the Ethiopian higher education system that values quality and is committed to continuous improvement. The Centre, meanwhile, is responsible for providing the higher education sector with guidance on strategy and policy. The Ethiopian Institute for Higher Education was established to contribute to the effective and efficient implementation of education policies, strategies, plans and programmes by developing the leadership and management capacity of the higher education sector.

2.2 Government policies, plans and laws

2.2.1 Education and training policy

The first government policy with provisions concerning the development of higher education in Ethiopia was the Education and Training Policy of 1994 (Ethiopia, Ministry of Education, 1994). The Policy establishes that there should be an appropriate nexus between education, training, research and development through coordinated participation among the relevant actors. Such a nexus is expected to encourage university-industry collaboration, which can be an effective approach to entrepreneurial training by combining theory and practical experiences.

The policy places an emphasis on making higher education research-oriented and enabling students to become problem-solving professional leaders in their fields of study and in relation to overall societal needs. It gives priority to research with a practical societal impact and stipulates that the necessary steps be taken to facilitate the coordinated efforts of all concerned. The provisions of the policy include coordinated curriculum development to ensure that students and trainees acquire the necessary entrepreneurial and productive attitudes and skills. It also provides for the creation of the necessary conditions for educational and training institutions to generate their own income and to use it to strengthen the educational process.

The need for autonomy of educational institutions in their internal administration and in the design and implementation of education and training programmes was clearly stated in the policy. It is also in this policy that the Government first stated its intention to introduce a mechanism for students to cover their educational expenses through service or payment after graduation.

2.2.2 Education sector development plans

Within the framework of the Education and Training Policy, the Government launched a 20-year development plan for the education sector. The plan had been translated into a series of five such national plans. The most recent programme was the Education Sector Development Programme covering the period 2015–2020. That Programme was developed with a strong emphasis on innovation in the research, knowledge exchange, teaching and learning activities of higher education institutes, as well as in their governance and external relations (Ethiopia, Federal Ministry of Education, 2015).

The goal of higher education, as stated in the Education Sector Development Programme, was "to produce competent graduates who have appropriate knowledge, skills and attitudes in diverse fields of study; to produce research which promotes knowledge and technology transfer based on national development and community needs; and to ensure that education and research promote the principles of freedom in exchange of views and opinions based on reason, democratic and multicultural values".

The Programme recognized that the research capacity of universities was constrained by a low level of available finances and by the small supply of capable researchers. It proposed an improved budget allocation model for universities that would provide greater autonomy to each institution, allowing a more responsive research agenda and increasing the share of funds allocated to research to bring it in line with international standards. The research staff capacity in universities was planned to be strengthened through an increase in postgraduate study opportunities (especially in doctoral studies) and through collaboration between staff in Ethiopian universities and universities abroad. The Programme stated the need for consideration to the introduction of a performance-based research system that links the delivery of quality research to the delivery of funding. It was also suggested that strengthening research activities through public-private partnerships with industry and other stakeholders and engagement in research and community services to improve the quality and relevance of research were areas of focus.

The emergence of more effective partnerships between businesses and educational institutions, such as the establishment of a science park with incubation units, was indicated as a mechanism to improve technology transfer and a source of generating additional revenue for universities.

2.2.3 Higher Education Proclamation

In 2003, the Government of Ethiopia introduced far-reaching reforms in the higher education sector through Higher Education Proclamation No. 351/2003 (Ethiopia, 2003). The Proclamation addressed: institutional status, requirements and autonomy; staff and students of higher education institutes; governance of public institutions; studies and research directions; income-generating enterprises; and cost sharing by students.

In 2009, the Government issued a revised Higher Education Proclamation that addresses, among other things, issues relating to the production of a skilled workforce, research and commercialization (Ethiopia, 2009). The Higher Education Proclamation was revised for the second time in 2019. The 2019 Proclamation is aimed at ensuring the quality and relevance of higher education institutes and making sure that they are centres of excellence in teaching, learning and community service (Ethiopia, 2019).

It is stated in the Proclamation that higher education institutes should undertake research and community services in national and local priority areas and disseminate the findings. The Proclamation also encourages joint academic and research projects to be carried out with national and foreign institutions or research centres. Every institution is required to have an institutionalized system that enables it to carry out

planned research and conduct joint research projects with other national and international institutions, research centres and industry.

The collaboration of higher education institutes with different economic actors is another area on which the Proclamation was focused, and it imposes a duty on higher education institutes to establish cooperation with industry and other institutes. The Proclamation further consolidated the provisions for university autonomy included in the Education and Training Policy. It grants autonomy to all public higher education institutions in the pursuit of their missions.

The law takes into consideration the financial needs of higher education institutes and allows them to be involved in different internal income-generating activities to support their missions, which allows the institutes to support their entrepreneurial objectives with a wide variety of funding sources and reduce their dependence on public funding. The issue of intellectual property protection for university-generated knowledge is also addressed in the Proclamation.

2.2.4 Science policy and strategy

The science policy and strategy was adopted by the Ministry of Science and Higher Education in 2020. Its objectives include facilitating the production of scientific knowledge at higher education institutions, technical and vocational education and training institutions, and research institutions (Ethiopia, Ministry of Science and Higher Education, 2020). In addition to its importance in facilitating the development of human capital, high-standard scientific research and scientific discoveries, the envisaged roles of the Policy and Strategy include the enhancement of the careers of scientists, their competitiveness and their increased global visibility.

The objectives of the policy and strategy also include strengthening and enhancing human capital development through quality teaching and learning, skills-based training, research, innovation and technology at all higher education institutes. The policy objectives also include the establishment of appropriate frameworks and partnership schemes for funding, the creation of research infrastructure, the commercialization of products and services, and a reward system to promote and advance the development of science culture, scientific research and innovation.

In order to create productive enterprises with diverse opportunities for job creation, entrepreneurship, creativity and innovation, the policy contained different strategies: establishing incubation and research commercialization centres and aligning the activities of science and technology organizations, professional societies, research institutions, science and industry parks, and technology parks with the activities of business enterprises. The importance of strengthening interactions among universities, research institutions and industry, and creating an enabling environment for industries to utilize research findings is also duly recognized in the policy.

In the policy, it is suggested that the Government should establish different funding mechanisms and earmark funds for science and research and development activities to be undertaken by higher education institutes, research organizations and other organizations involved in promoting the growth of scientific and indigenous knowledge.

In order to ensure the proper implementation of the policy, higher education institutes are expected to promote excellence in the production, growth and dissemination of advanced scientific knowledge through problem-solving, teaching, research and community engagement. The institutes are also required to advance student-centred governance and education, as well as development-oriented and technology transfer-focused research that best supports the fulfilment of the primary national goals of democratization and the achievement of other national priorities, including science education.

2.2.5 Directive on university-industry linkage

A university-industry linkage directive was issued by the former Ministry of Science and Technology in 2013. In this directive, mechanisms are suggested to mediate the disconnect between the

activities of academia, research institutes and industry. It is aimed at ensuring that universities provide practical training based on the identified needs of industry and seeing that research and technology transfer activities are undertaken in the spirit of enhancing the competitiveness of industry (Ethiopia, Ministry of Science and Technology, 2013).

Under the directive, students are encouraged to spend a period of time in an organization to practice what they have learned at university, where most of the knowledge is based on theory. During training in industry, students learn about the skill sets required, the demands of the industry and work ethics. They can put their theoretical knowledge into practice and realize their full potential.

A national university-industry linkage forum was established on the basis of the provisions of the directive. The forum was organized under the National Science, Technology and Innovation Council, which is the high-level decision-making body on science, technology and innovation issues in Ethiopia. The Council has a key role in selecting and prioritizing national technology capacity-building programmes, allocating public resources for science and technology activities, determining priority areas for the development of human resources in science and technology, and facilitating the interaction of different innovation actors (Ethiopia, Ministry of Science and Technology, 2012). A zonal forum was also created on the basis of the country's different economic growth corridors.

2.2.6 Science, Technology and Innovation Policy

The Government of Ethiopia adopted the current National Science, Technology and Innovation Policy in 2012. The Policy envisaged the establishment of a national innovation system that strengthens the links between different innovation actors. It contains strategies for creating strong connections between universities, research institutes and industry in the learning and adaptation of foreign technologies.

Recognizing the small number and weak capacity of the country's human resources for the effective transfer of foreign technologies, the policy requires the national education and training system to place emphasis on the production of engineers and natural scientists. Accordingly, the strategies of the Policy in the area of human resource development include: developing science and technology institutions that focus on producing highly qualified technicians, engineers and scientists who meet the economy's demand for a trained workforce and on increasing student enrolment in undergraduate programmes in science, technology and engineering fields, with a special focus on female enrolment in these areas.

The Policy emphasizes the need to strengthen the national research system and to orient it towards national technological demands. The strategies to be followed to bridge the gap between research and the needs of the economy are: building the capacity of research institutes; ensuring that research activities in higher education institutes and research organizations are anchored in societal needs; encouraging joint research by universities, government research organizations and industry; and supporting medium-sized and large enterprises in establishing research centres for the adaptation of foreign technologies.

The Policy proposes strategic directions to be followed to forge stronger university-industry linkages: establishing a system that creates a synergy between the technology transfer and development endeavours of universities, research organizations, technical schools and industry; creating a favourable environment for academic staff and students at universities to engage in the technology transfer activities of industry; and establishing a system that enables universities to provide industry with an advisory role in technology transfer activities.

A revised draft science, technology and innovation policy was presented for stakeholder discussion in March 2021. The objectives of the draft policy include: creating a system for the production of competent human resources who will be active players in industry; creating favourable conditions for science and technology research and innovation; and promoting innovation for employment generation, wealth creation and the growth of gross domestic product. One of the strategies identified in the draft policy for human resource development is the provision of practical training for students and teachers at higher education

institutes in industry and the participation of senior industry professionals in teaching at higher education institutes to enable them to share their practical experience with students.

The financing of science, technology and innovation activities through a wide variety of funding sources and the creation of an incentive scheme to promote innovation and entrepreneurship are also among the strategies specified in the draft policy. The draft document also contains strategies that are focused on strengthening interactions among the main innovation actors.

Table 2.1
Entrepreneurship and government policies

Government policy/law/programme	Elements of university entrepreneurship indicated in the policy/law/programme						
	Leadership and governance	Organizational capacity	Teaching and learning	Pathways for entrepreneurs	Knowledge exchange	Internationalization	Impact measurement
Education and Training Policy	☐ ☐	☐	☐		☐	☐	
Science Policy and Strategy	☐	☐	☐		☐	☐	
Science, Technology and Innovation Policy		☐	☐		☐		
University-industry linkage directive			☐		☐		
Higher Education Proclamation	☐	☐	☐	☐	☐	☐	☐
Education Sector Development Programme	☐	☐	☐		☐	☐	

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

2.3 Governance of public higher education institutes

The board of a public higher education institution is its supreme governing body and is responsible for the review, examination and approval of the strategic plans, budgets, annual plans, policies and academic and administrative programmes of the institute. It also ensures the proper implementation of the institutes' activities and its adherence to internal regulations. The chairperson of a board is appointed by the Minister of for Science and Higher Education. The board of a higher education institute is composed of seven voting members, all of whom are appointed by the Ministry and the president of the respective institute. Presidents and vice-presidents of higher education institutes are nominated by the board for appointment by the Ministry of Science and Higher Education or another relevant government body, as appropriate. The responsibility of the board also includes issuing directives regarding qualification requirements and the procedure for the nomination and appointment of senate members and academic officers. The boards of higher education institutes also advise the Ministry on matters relating to education, research and the governance of their respective institutions.

The leading body of higher education institutes for academic matters is the senate. The senate of each institute accredits its academic programmes with the consensus of the board and the Ministry. It accredits curricula, supervises and guides academic departments to ensure the relevance and quality of

education and research, and examines and approves the opening, merger and closure of academic departments. The senate also determines an institution-wide framework for quality enhancement and student assessment. The majority of members of the senate shall be meritorious and senior members of the academic staff appointed by the president.

The managing council, which is comprised of senior officials of the higher education institute, including the president and the vice-presidents, deliberate on strategic issues and other cases that may require collective examination. The responsibilities of the council also include monitoring, coordinating and evaluating institutional activities. The core members of the council are also members of the university council. The latter also includes all deans, heads of the gender office, members of the senate standing committee, the chief librarian, the registrar, other academic officers, service department heads and an appropriate number of academic staff and student representatives. The university council advises the president on institutional strategic plans and budget proposals, academic programmes, cooperation agreements, the division, merger and closure of academic departments, and performance.

2.4   Funding higher education in Ethiopia

The Higher Education Proclamation contains provisions concerning the funding of higher education institutes by the federal Government or regional states through a block grant system based on budget requirements indicated in the strategic plans of the institutions. The Proclamation allows for flexibility and autonomy of institutions compared with line items to determine how public funds are spent. The current allocation formula for higher education funding in Ethiopia takes many parameters into account, such as student population, staff population, discipline aggregation, the context of institutions, and their most recent budget allocations. More attention is given to the capital budget, which has a 60:40 ratio in the recurrent budget share. The budget allocation is related to performance in the areas of learning achievements and problem-solving research outputs.

Public higher education institutions can establish income-generating enterprises that have their own legal personalities. The enterprises, like any other business organization operating in the country, are required to comply with legal requirements. Higher education institutes may also establish an income fund or a research and innovation fund. The income fund may be used for capacity-building activities, prizes and other activities approved by the board governing the institute. The research and innovation fund, on the other hand, helps universities to carry out their role in national development by improving both undergraduate and graduate education to prepare the highly qualified professionals that Ethiopia needs to absorb and adapt established practices to suit local resource endowments and market prospects. It can be used to establish modern teaching infrastructure in higher education institutes, support programmes and initiatives to establish and strengthen links between higher education institutions and the production sector, and improve graduate level research in universities.

Starting from the 2003 academic year, students enrolled in public universities cover part of their costs of education. This is a government loan programme for higher education students to cover the partial cost of teaching and learning. Payment of the costs shall be made in the form of tax payable from the student's salary or other income obtained after graduation. Universities also collect tuition fees from part-time students, evening students and distance learners.

2.5   Higher education quality

The Government of Ethiopia started giving due acknowledgment to the quality of higher education in 2003 when the Higher Education Relevance and Quality Agency was established. Since the establishment of the Agency, a series of activities have been undertaken, including the creation of programme specifications (with a focus on graduate profiles and quality assurance mechanisms), institutional self-evaluation and external quality audits. There were also some collaborative projects with foreign institutes to establish a qualification framework for higher education.

Other measures with implications for university entrepreneurship that were taken to improve the quality of the teaching and learning process include: the harmonization of the curricula of all undergraduate programmes, including a course in entrepreneurship; the adoption of a modular approach for course delivery to enhance active learning: the equipping of libraries and laboratories; and the institution of quality assurance offices at each university. The primary purpose of the quality assurance offices is to provide leadership in the coordination of university-wide efforts to improve student learning and institutional effectiveness. The offices coordinate and direct the development of strategies, policies and procedures directing quality assurance and enhancement to ensure that they are maintained, reviewed and enhanced. The three universities surveyed have also adopted policies to ensure quality at the institutional level.

2.6 Gender and higher education

The participation of women in higher education, especially in education and training in science, technology and innovation, remains low and they are also underrepresented in science, technology and innovation careers. In 2016/17, the share of female enrolment in undergraduate programmes was only 35.7 per cent and women were a minority in postgraduate programmes, constituting only 17.8 per cent of students. Considering only enrolment in doctoral programmes, the share of women was a mere 8.7 per cent (Ethiopia, Ministry of Education, 2018a). Most universities in the country have introduced initiatives to support female students through tutorials, and the Ministry of Education adopted the Gender Strategy for the Education and Training Sector in 2015. However, female students still remain underrepresented in all fields, especially those related to innovation and entrepreneurship development, at all levels of higher education, and dropout rates are high for female university students in these areas.

The percentage of female teaching staff in universities in all fields was 12 per cent and the figure for female lecturers in science and technology fields was much lower. The share of female leaders in academic institutions also remains very low and, in 2020, the country did not have a single female president at any university, public or private. A woman was recently appointed to the post of President at Mekelle University. There are, however, observable changes at the level of university vice-presidents. From a limited number of female vice-presidents several years ago, the number has now risen to 29 (or 16.27 per cent of top university leadership positions).

The situation in the area of research and development reveals the low participation of women both as leaders of research institutes and as researchers. In 2017, the number of people engaged in research and development activities was 31,172. The number of researchers in higher education institutes was 12,060, while 18,125 were in government organizations, 533 in business enterprises and 454 in private non-profit organizations. Of the total number of researchers, women accounted for only 20.4 per cent (6,363), which is lower than the figures of some least developed countries in Africa (Technology and Innovation Institute, 2017). In the higher education sector, the situation is even more dismal, with women representing only 14.9 per cent of personnel engaged in research and development activities.

3.   Entrepreneurship in the Ethiopian higher education system

3.1   Leadership and governance

3.1.1 Integration of entrepreneurship in university missions and strategies

Developing an entrepreneurial and innovative culture in a higher education institute requires entrepreneurial activities to be established as part of the strategy of the institution. Entrepreneurship should be clearly reflected in the mission of the university and clear objectives that emphasize entrepreneurship should be articulated. The strategy should also incorporate a clear implementation plan and define key performance indicators to measure progress.

The Higher Education Proclamation of Ethiopia, issued in 2009, and the revised Proclamation of 2019 require every public higher education institute in the country to have a strategic plan (Ethiopia, 2009, 2019). The strategic plan shall contain, among other things: strategic objectives; academic priorities; learning outputs; measures for institutional and human resource development; planned research projects and programmes; a variety of programmes and continuing, distance and online education; the composition of its academic staff and measures to increase the proportion of senior positions held by women; and assistance for disadvantaged students. It should also include indicative block-grant budget commitments made by the Government and a commitment by the institution to make up, through other sources of income, the financing gap that may occur.

The three universities included in the survey formulated institution-level strategic plans as part of a five-year cycle. The different units under the universities also have their own strategic plans that are aligned with the strategic directions of the institutes. As universities are composed of multiple colleges, departments and supporting units, which often exercise some autonomy over their operations, it is common to develop both an overall university strategic plan and linked strategic and action plans at the college, department and supporting unit levels. These entities are where the ongoing work of the university is performed so such unit-level strategic plans guide their contributions to the university's mission.

The mission of Addis Ababa University is to produce competent graduates, provide need-based community service and produce problem-solving research outputs through innovative and creative education, research and consultancy services in order to foster the socioeconomic development of the country. Inculcating a spirit of entrepreneurship in the university's community was indicated as one of the core values in its institutional strategic plan of 2015–2020 (Addis Ababa University, 2015a). The plan contained four strategic themes that indicate the critical areas in which the university intended to excel and create value for customers and stakeholders by breaking its vision down into operational components: excellence in learning and teaching; excellence in research and technology transfer; excellence in community service, strategic partnership, and resource generation and management; and excellence in good governance and diversity management.

For excellence in teaching and learning, emphasis was placed on producing competent graduates who meet the demands of the market and are equipped with entrepreneurial attitudes to provide them with better life opportunities. The research and technology transfer strategic theme of the strategic plan was also designed in line with the concept of creating value from knowledge by making it relevant to societal needs and available for economic use by translating knowledge into useful products, services, processes and entrepreneurial activities. In order to ensure the

relevance of research to societal needs, the involvement of society was envisaged in identifying priority research areas and monitoring the relevance of research output to alleviate its immediate and long-standing problems. The involvement and ownership of society was also illustrated through participation in research processes and the utilization of the research output to bring about sustainable development. Establishing a system to identify research collaborators on issues of common interest and making pertinent agreements to exchange experiences and expertise was also a focus area, which was aimed at allowing entrepreneurial teams to introduce new initiatives and bring in international partners.

The mission of Haramaya University, like that of Addis Ababa University, was focused on the four major areas of university activity: producing competent graduates in diverse fields of study; undertaking rigorous, problem-solving and cutting-edge research; disseminating knowledge and technologies; and providing demand-driven and transformative community services. The development of a culture for generating new ideas, processes, services, technologies and entrepreneurial skills was among the core values and strategic issues of the university, as indicated in its strategic plan for the period 2015–2020 (Haramaya University, 2016). Other strategic issues included in the strategic plan were: relevance and quality enhancement in teaching, learning, research and community engagement; leadership and governance; and institutional collaboration and internationalization.

Haramaya University had included in its plan the objective of conducting demand-driven research programmes that could be achieved by carrying out diversified and interdisciplinary research under various programmes. The programmes were expected to provide quality, problem-solving, market-oriented and sustainable technologies and services, nurture competent and ethical research and researchers, and establish a feedback and enhancement system. Networking and internationalization were planned to be achieved by partnering with stakeholders in research problem identification, proposal formulation, execution and technology generation, the establishment of collaborative research with national and international organizations, and the organization of stakeholder platforms and workshops. The diversification of sources of funding for research programmes, efficient resource utilization, the increase in the flexibility and efficiency of processes through empowerment, decentralization, strengthening system integration, team-building, collaboration and staff development were among the stated objectives to achieve excellence in research and technology exchange. They are all features of an entrepreneurial university's strategy that, if practically applied, help to develop an entrepreneurial culture in the institute.

The third university whose staff took part in the survey, Bahir Dar University, has a mission of contributing substantially to the development of the country and beyond through high-quality education, research and community service. The strategic plan of Bahir Dar for the period 2015–2019 identified the following six strategic themes: excellence in education; excellence in research and community services; excellence in academic staff development; excellence in institutional leadership and administration; improved infrastructure; and excellence in communication and partnership (Bahir Dar University, 2015).

The intention to transform Bahir Dar University into an entrepreneurial institute was revealed through the objectives outlined in the strategic plan. One of the strategic objectives was to transfer proven technologies to society, which was seen as one of the ways through which the university could strengthen its presence in the community and become a driving force of entrepreneurship development. The strategic plan also included the expansion of teacher

development programmes, an increased focus on problem-solving and income-generating activities, and partnership development as objectives to support entrepreneurship development.

Bahir Dar University had included in its strategic plan an objective to develop strategic communication. However, there seems to be a gap in the implementation of the plan in this respect. The methods to be followed to achieve this objective were: create platforms for the university community and for external stakeholders to share the visions, missions and values of the university and its planned activities; and use print and electronic media to share the strategic plan with stakeholders. However, it does not appear that these methods were applied to the purpose of creating a common vision.

Although many of the objectives and strategic themes of the three universities constitute elements of university entrepreneurship, the respondents from Addis Ababa University and Bahir Dar University who took part in the survey are of the opinion that entrepreneurship was not clearly integrated as a major part of the universities' strategies. Some 50 per cent of the respondents from Addis Ababa University replied that integrating entrepreneurship into the university's strategy had been discussed and broadly defined but had not been adopted as part of the strategy. In a similar way, 33 per cent of the academics from Bahir Dar University reflected in their responses that some general discussions about making entrepreneurship part of the university strategy had taken place, but no specific measure had been defined and no practical steps had been taken.

On the other hand, 83 per cent of Haramaya University respondents believe that the university has taken steps to make entrepreneurship part of its strategy. They indicated that the effort to include entrepreneurial activities in the strategy can be seen as somewhat successful, although not as successful as it could have been. This may be attributable to a better understanding among the staff of the broader approach to entrepreneurship, rather than the narrow definition of entrepreneurship that is closely related to the idea of developing or running a business (Laskowski, 2013). It may also be seen as an indication of a common understanding of the meaning and relevance of entrepreneurship in relation to the needs of the university.

Overall, 50 per cent of respondents from the three universities do not agree with or are not sure about the statement on the explicit inclusion of entrepreneurial learning and teaching, research on entrepreneurship, intellectual property and business start-ups in the strategic plans of the universities. However, they have a different view concerning knowledge exchange and partnership, and technology transfer, as 90 per cent of them confirmed that these issues are clearly indicated the strategies.

Regarding research commercialization, the responses of the academics from Haramaya University indicated that, in their view, the practical application of research outputs received the attention it deserved during the development of the university strategy. However, the views expressed by 50 per cent of the academics from Addis Ababa University and Bahir Dar University reflect their feeling that the issue was not explicitly addressed in the strategic plans of their universities. Incubation, the internationalization of the university and engagement in the community are areas that the respondents from all the three universities consider to be properly addressed and clearly shown in the strategies.

The views of respondents who hold decision-making positions in their respective universities about the inclusion of entrepreneurship in their institutions' strategies differ from those of the other respondents. Even within the same university, there is a lack of consensus on a number of issues on entrepreneurship in relation to the institutional strategy. It appears that there are

different perceptions among the respondents about the meanings, values and purposes of university entrepreneurship. This is a clear indication of weakness on the part of the university management in promoting a common understanding about university entrepreneurship among academic communities.

3.1.2 High-level commitment to implementing the entrepreneurial strategy

The strategies of public universities in Ethiopia go into the implementation stage after approval by their respective boards. The board also follows up on the implementation of the institution's strategy. The board is the supreme governing body of public universities and is accountable to the Ministry of Science and Higher Education. The members are past or present holders of high-ranking positions and persons of note, especially in teaching or research and in terms of their integrity. The board members may also be representatives of the customers of the institution's products and services and whose exceptional knowledge, experience and commitment enable them to contribute to the attainment of the institution's mission and the objectives of higher education generally.

The universities surveyed have strategic planning directorates or offices that are responsible for all matters pertaining to university level plans, reports, monitoring, evaluation and organizational structures. The Office of Strategic Planning at Addis Ababa University is one of the offices under the President, and the head of the Office is directly accountable to the President. The Office is headed by a director and has experts in planning, monitoring and evaluation. It liaises with internal and external stakeholders with the aim of enhancing joint priority-setting, planning, implementation, review, evaluation and communication activities. The responsibilities of the Office also include collaborating with other units of the university to develop strategic alliances with foreign universities and international associations.

In a similar way, the strategic planning directorates of Haramaya University and Bahir Dar University are responsible for the implementation of their institutional strategies in relation to their entrepreneurial agendas. They provide support to the university management in the key areas of strategic development, planning, and measurement and evaluation by focusing on the activities of the entire university. These directorates, which have senior-level representation among university management, are also responsible for university-level budget preparation and budget allocation to the units of the universities. The existence of such units in the universities creates a favourable institutional arrangement for advancing their entrepreneurial agendas.

Overall, 50 per cent of the academics who completed the questionnaire from Haramaya University believe that the university's leadership is committed to the entrepreneurial agenda. Their responses reflect the existence of an understanding among the management teams about the need to deliver on the entrepreneurial agenda. There have been recent activities of the University-Industry Linkage and Entrepreneurship Directorate on promoting university entrepreneurship. For instance, the Directorate recently conducted a national conference on employment, entrepreneurship development and innovation in Ethiopia. Haramaya University also organizes short-term training on entrepreneurship for graduating students. These activities indicate the existence of some interest among senior managers in advancing the university's entrepreneurial agenda.

Although the organizational structures that are in place may indicate the commitment of university leadership, the information gathered through questionnaires from respondents from Addis Ababa University and Bahir Dar University show otherwise. The responses of half of the

respondents to the Bahir Dar University survey indicated an absence of leadership commitment to implementing the university's entrepreneurial strategy. In the case of Addis Ababa University, where the majority of the respondents (88 per cent) are not satisfied with the level of commitment by the leadership to implementing the entrepreneurial strategy, there is a clear need to introduce changes in promoting the interest and involvement of the leadership in realizing the benefits of developing entrepreneurship.

3.1.3 A model for coordinating and integrating entrepreneurial activities

There are different models for coordinating the entrepreneurial activities of a university, including creating a dedicated unit with close links to senior management, assigning specific professors who have entrepreneurship in their title or a chair on or related to entrepreneurship, and establishing an entrepreneurship centre that facilitates access to and increases the visibility of entrepreneurship promotion activities.

The desk review and the questionnaire responses revealed that there are no professors with specific responsibilities related to promoting entrepreneurship. Rather, the universities took the initiative of establishing entrepreneurship centres and other units within their organizational structures with the role of promoting entrepreneurship in their institutes. The entrepreneurship centres create opportunities for the universities to play a role in the socioeconomic development of their community.

Addis Ababa University has a business incubation centre that provides tenants with workspace, equipment, technological support and entrepreneurial skills. The centre is deemed to have a pivotal role in commercializing research outputs. The university also has a Resource Generation, Mobilization and Management Office that is accountable to the Office of the Vice-President for Institutional Development. The Office is tasked with organizing and managing the operation of the university's revenue generation centres and is involved in the entrepreneurial activities of its enterprises and other business centres operating at different campuses.

Bahir Dar University also has an Entrepreneurship Development and Incubation Centre, which is responsible for transforming innovative and technology-based ideas into tangible modern business enterprises. It works to catalyse and promote the development of knowledge-based business enterprises and create employment opportunities by allowing students, faculty and members of the local community to incubate these ideas. Creating an environment that helps to provide value added jobs and services through technology-based incubation and the commercialization of research and development outputs is also an objective of the university.

In a similar way, the University-Industry Linkage and Entrepreneurship Development Directorate at Haramaya University has been rendering various services to the community in addition to the university's teaching and learning activities and research undertakings. The Directorate is under the Vice-President for Community Engagement and Enterprise Development. The Directorate is made up of four departments: the Agricultural Development Coordination Office; Training and Consultancy Services; the Resource Centre and Recreational Services Coordination Office; and the Sales and Rental Houses Coordination Office.

Most of the Addis Ababa University respondents (88 per cent) gave a negative or neutral answer to the statement that the university has a clear model for coordinating and integrating entrepreneurial activities at all levels across the university. Among the respondents from Bahir Dar University, 83 per cent are not satisfied with the way that entrepreneurial activities are coordinated

in their university. However, 68 per cent of Haramaya University respondents perceive that entities in their university are doing a good job and are fulfilling their entrepreneurship coordination role in a satisfactory way.

3.1.4 Autonomy of faculties and units

The information obtained from the Addis Ababa University survey participants indicates that faculties, departments and units do not have the autonomy to act on their entrepreneurial initiatives. Moreover, 50 per cent of the respondents believe that the university's units do not have any autonomy at all in their activities, while the remaining respondents indicated the existence of barriers to undertaking entrepreneurial activities. A similar response was obtained from Bahir Dar University staff, 88 per cent of whom noted the lack of autonomy of university units in their activities. Although the scores given by Haramaya University respondents on the issue reflect a somewhat better situation, the response of half of the respondents is indicative of their dissatisfaction about the level of autonomy of the university's departments and colleges.

The lack of autonomy at the level of academic units is a reflection of the current situation at the institutional level. Internal autonomy requires the university itself to have a certain degree of autonomy. Although various government policies and laws confirm the autonomy of universities in their activities, in practice, there is a lack of any genuine commitment to academic freedom and institutional autonomy. Universities in Ethiopia face challenges in a number of areas, including government interference in various areas, including in student admissions, curriculum-related decisions, the required competence level of graduating students, student placements, the choice of study field by students, staff recruitment, salary levels of staff and the flexible use of public funding for research.[9]

3.1.5 The university as a driving force for entrepreneurship development

One of the main functions of a university is to support and drive regional, social and community development. It should contribute to the social and economic development of its immediate environment. In this respect, some examples of good practices were observed in the three universities surveyed. For instance, Addis Ababa University revised the national building code standard. Haramaya University supported the production and productivity of locally grown crops through high-quality, disease-resistant and farmer-preferred varieties. Farmers in the region were able to solve their seed supply problems through the production of these crops. In addition to promoting the production and productivity of crops, the university also made a significant contribution to technology and knowledge transfer through its various farmer training centres. It has several research stations in different agroecological zones for disseminating locally appropriate agricultural technologies. Its services reach a wider geographical area and target a large number of community members in eastern Ethiopia.

Bahir Dar University has an Integrated Watershed Management Community Service Centre, which helps farmers to receive capacity-building training in the area of land-use management and livelihood enhancement schemes. It also has memorandums of understanding with regional government offices for the creation and maintenance of professional collaboration

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[9] The President of Addis Ababa University stated these challenges in a speech he made during a discussion held on 19 March 2021 on the need for university autonomy in Ethiopia.

for training, research and consultancy services. The Ethiopian Institute of Textile and Fashion Technology, located at Bahir Dar University, has a good record of collaboration with local and foreign companies. One such collaboration with Bahir Dar Textile Share Company is aimed at practical education, student internships, joint research and consultancy. The Institute also has collaborations with Eptanova, a leading Italian provider of complete advanced finishing solutions for a variety of industries, with branches all around the world.

There is a partnership between Bahir Dar University and the Ethiopian Maritime Training Institute to provide professional maritime training for Ethiopian graduates of engineering. The programme provides training for more than 500 marine engineers and electro-technical officers annually and is fully compliant with the International Convention on Standards of Training, Certification and Watchkeeping for Seafarers and the Maritime Labour Convention. The Institute facilitates the employment of its graduates in world-renowned shipping companies.

Table 2.2
Examples of community development services by the universities surveyed

Institution	Examples of community development service
Addis Ababa University	• Development of dynamic and integrated water resource management system for river basins in Ethiopia • Revision of Ethiopian building code standard
Haramaya University	• Provision of disease-resistant and farmer-preferred varieties • Technology and knowledge transfer through farmer training centres
Bahir Dar University	• Farmer training in land-use management and livelihood enhancement schemes • Maritime training for Ethiopian graduates of engineering and facilitation of their employment by world-renowned shipping companies

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

However, these examples indicate only the beginning of a number of efforts to create value by these universities for the benefit of the community in their regions. In order to enhance existing efforts, the universities have initiated institutional measures that help to strengthen the role of academic staff in community entrepreneurship development. For instance, the Vice-President for Research and Technology Transfer of Addis Ababa University issued guidelines for community engagement with an extended structure at the college and departmental levels. To guide the overall community engagement of the university, the Office of the Director for Community Services is assigned to work with various academic units to assess core community needs and to design, implement, evaluate and coordinate community engagement.

In the guidelines, six strategic issues were identified for consideration: creating and supporting an organizational infrastructure that promotes community engagement; cultivating a culture of community engagement among university staff and the student body; building a strong partnership that benefits both the university and the community; working with academic units to

assess core community needs and design, implement, monitor and evaluate projects that engage and serve the community; advocating volunteerism; and soliciting and using funds for community engagement.

Figure 2.1
Leadership and governance
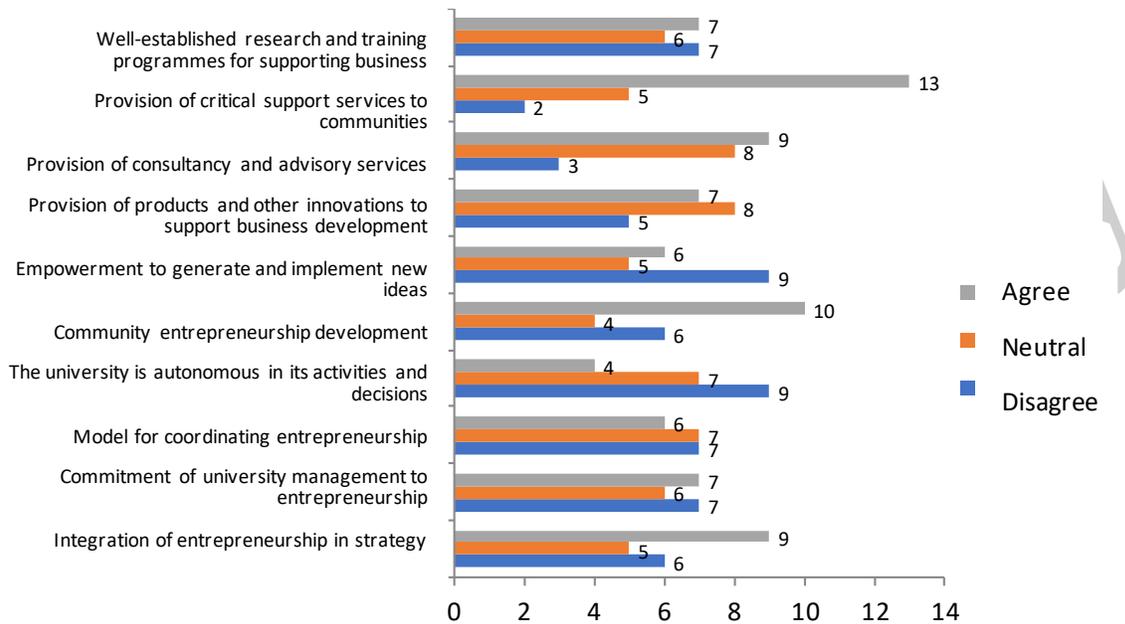
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

Notes: Respondents from Addis Ababa University, Haramaya University and Bahir Dar University were asked to indicate their level of agreement with the leadership and governance-related statements in the context of their institutions. The respondents indicated their level of agreement on a seven-point Likert scale from 0 = "Fully disagree" to 6 = "Fully Agree". In figure 2.1, disagree means <= 2, neutral = 3 and agree >= 4. The total number of responses was 20.

3.2   Organizational capacity: funding, people and incentives

3.2.1 Funding and investment sources

Higher education institutes in Ethiopia receive a very large share of their financing from the Government. It is complemented by a small amount of funding obtained from foreign donors and the internal revenue-generating activities of the institutes themselves. They are mainly funded by the federal Government or regional states for teaching and learning, with little funding allocated to research and technology transfer or community services. The rapid expansion of the higher education sector made it difficult for the Government to adequately meet the financial needs of universities and higher education institutes for their teaching, research and community service activities.

The government research grant is not competitive and research funding therefore goes to those who have little capacity to do research. Furthermore, the current inflexible system of budget utilization does not encourage research activities (Ethiopia, Ministry of Education, 2018b). Procurement is also a major challenge for the utilization of budgets by the institutions, as providers are not delivering on time with the quality required under their agreements. In addition, the procurement rules and regulations are not suitable

for procuring the necessary inputs. As a result, the purchasing system is a bottleneck for research, community service and technology transfer projects.

The majority of respondents from all three universities either think that their institutions do not have sustainable financial strategies in place to support their entrepreneurial agendas or they have a neutral opinion. For instance, 63 per cent of Addis Ababa University respondents said that their university does not have a system to consistently fund and invest in the university's entrepreneurial activities. On the issue of alternative funding sources, close to half of the respondents from the three universities believe there are only limited internal and external funding sources and investment to support the entrepreneurial objectives of the institutions. The respondents reflected that, with the envisaged future growth of entrepreneurial activities in academic institutions in Ethiopia, it will be difficult to ensure financial sustainability while being dependent on public funding. The universities will therefore have to explore mechanisms of compensating for the potential scarcity of public funding.

3.2.2 Fostering relationships among internal stakeholders

The absence of mechanisms and channels to bring internal stakeholders together to foster their involvement and relationships, in line with the entrepreneurial agendas of the surveyed universities, is seen in the responses of academics. Their responses indicate a failure on the part of the universities to effectively utilize the available knowledge and resources through collaboration between different units. Two of the respondents from Bahir Dar University are of the opinion that absolutely no measures are taken by the university to encourage and promote collaboration between different academic units. The absence of mechanisms to foster relationship between colleges, faculties and departments is also revealed by the Addis Ababa University academics, 75 per cent of whom reflected on the poor performance of the university in this respect. Moreover, 50 per cent of Haramaya University respondents have a neutral stance on the issue, while the remaining 50 per cent are of the view that there are practices encouraging internal collaboration in the university.

As staff and students are important internal stakeholders that support the entrepreneurial agenda, there have to be synergies and linkages across faculties, departments and other structures in order to break down traditional boundaries and silos. Universities should have mechanisms in place to exploit internal knowledge and resources through, for example, shared facilities across faculties, student-staff structures, interdisciplinary structures, cross-faculty teaching and research groups.

3.2.3 Recruiting and engaging with entrepreneurial individuals

The Higher Education Proclamation of 2019 allows universities to use the expert knowledge of professionals on the basis of joint appointments. Professionals with a high degree of relevant expertise from industry, business, research establishments and other organizations can serve as academic staff in universities on a joint appointment basis. The national Education Development Roadmap also recommended the development of a guideline that allows universities to appoint industry leaders as part-time professors so that they can periodically make lectures to students. This is indicated as being important to creating opportunities for students to acquire relevant skills and create connections with industries before completing their studies.

The responses of the survey participants, however, show that the provisions of the higher education law for the joint appointment of people outside academia had not been adequately applied at all three universities and they had failed to benefit from the entrepreneurial knowledge of experts in different academic fields who work in the country's various organizations. The responses also reflect that the universities do not use entrepreneurial skills and knowledge as criteria in the recruitment of academic staff. The main sources of academic staff for Ethiopian higher education institutes are graduating students who are recruited on the basis of their academic performance in undergraduate programmes.

The failure of Ethiopian universities to involve industry professionals with entrepreneurial experience and attitudes in teaching reflect the difficulties in exercising autonomy in the joint appointment of staff. Although there are provisions in government policies and laws that allow universities to use the expert knowledge and experience of professionals from industry with entrepreneurial mindsets, there are a number of hurdles when it comes to the practical implementation of those provisions.

3.2.4 Investment in staff development to support the entrepreneurial agenda

According to the information provided by the university staff who responded to the questionnaire, the emphasis placed on staff development at the three higher education institutes is not satisfactory. The dissatisfaction level is the highest among respondents from Addis Ababa University, all of whom feel that staff development initiatives are lacking or are not implemented to a satisfactory level.

Without staff development initiatives targeting the focus areas of the universities, it is unlikely that the institutions will be successful in their entrepreneurial endeavours. In recognition of this, the 2016–2020 strategic plan of Addis Ababa University included capacity-building schemes for staff through the provision of on-the-job training, workshops and short-term training, as well as efforts to enhance their participation in high quality and ethically sound research activities at the national and international levels and to give them opportunities for further education. The University's in-house training programmes offer good options that are less resource intensive for the University in terms of budget, and that also enable individual staff members to use their time efficiently. Such training programmes can also increase collaboration across units. Internships and temporary placements in businesses and business support organizations are considered to be possible training opportunities. The University has also taken further steps by establishing an office with responsibilities for staff development: a teaching learning support office.

Similarly, the Academic Development and Resource Centre of Haramaya University and the Centre for Capacity-Building Programmes of Bahir Dar University design and run different training programmes for academic staff in order to develop their professional competencies. The centres work to enhance the engagement of academic and administrative staff in meaningful teaching and learning processes, research, and institutional and community services. The programmes include short-term training geared towards improving the research capacities of staff, arranging short-term training and forums for the exchange of ideas to improve the teaching and mentoring skills of the academic staff.

There are capacity-building mechanisms for teachers and managers that have strengthened the higher education system in the country, especially in the more established universities. For example, the Government has established an extensive master of sciences and doctoral programme at Addis Ababa University, in collaboration with foreign universities, in order to upgrade the capacities of academic staff in the public higher education sector. The establishment of postgraduate programmes in the country made it possible to replace foreign training for students in a number of areas.

The number of public universities offering doctoral programmes reached 10 in 2016, having increased from only 1 in 2005. The increasing demand from the newly established and expanding public universities for trained staff with higher degrees (masters and PhDs) and the growing need for a highly trained labour force by other sectors of the economy are the major factors driving the growth of doctoral programmes in Ethiopian universities.

3.2.5 Incentives and rewards for entrepreneurial staff

In 2012, Addis Ababa University started conferring various awards on meritorious employees with track records of outstanding performance. Since then, both academic and administrative staff members of the university have been recognized for their service in teaching and other academic activities. The university also has a publication incentive scheme, which has been implemented for some time, to encourage research and inculcate a habit of publishing in the university. The university award guidelines include a distinguished service award, a distinguished teaching award, a distinguished research award, an

emerging faculty scholar award and a make-a-difference award. The criteria for all of these award categories include elements that fall under the promotion of university entrepreneurship. For instance, the reason for conferring a distinguished service award at Addis Ababa University is to recognize an outstanding performance in quality service, leadership, research, teaching, community and international networking and engagement.

Bahir Dar University also gives awards for staff who excel in teaching, research and publication. Colleges and faculties are also recognized for their good work in publishing. The objective of the award is to encourage academic staff to engage in research and help them to contribute to realizing the vision of the university. Haramaya University has also created incentives and an award system to acknowledge staff for their contributions. The general objective of the system is to establish a merit-based system that can help to foster the motivation and commitment of academic staff to making outstanding contributions by participating in research endeavours. The types of research awards are: the best researcher of the year award; the best young researcher of the year award; and the long-term research of the year award.

The information generated through the document review and the questionnaire responses do not indicate the existence of incentive schemes for university staff in Ethiopia in the form of a reduction of their teaching responsibilities or a sabbatical year to develop their business, namely, a "spin-off fellowship". Rather professors have huge pressure in the form of their teaching load and practically no time to advance their entrepreneurial endeavours in areas other than teaching (Ethiopia, Ministry of Education, 2018b). Although there are some encouraging developments in incentivizing and rewarding staff for their contributions to entrepreneurship, in the views of the respondents the current practice is far from adequate. The respondents have shown their high level of dissatisfaction with the current system, which lacks clear rewards for staff who actively support and implement the university's entrepreneurial agenda. The degree of discontent is much higher among Addis Ababa University respondents than those from the other two universities, with 88 per cent of Addis Ababa University respondents indicating that the university has a poor performance record in this area.

3.2.6 Entrepreneurial support targeting female staff and external partners

The responses given by the survey participants to the question on entrepreneurial support for female staff revealed that inadequate attention is given to promoting the valuable entrepreneurial skills and knowledge that female academics possess. According to 88 per cent of Addis Ababa University respondents, no measures have been taken to empower female staff. Likewise, 67 per cent of Haramaya University respondents indicated that the university did not give adequate attention to the issue of gender. A better picture was painted by 50 per cent of Bahir Dar University respondents who felt that some successful measures had been taken by their institution.

The responses of the survey participants align with the facts presented by the document reviews. The reviews indicated that higher learning institutions in Ethiopia are characterized by a low rate of participation of women in academic leadership. Furthermore, there is a very low rate of female participation in research and publication activities. Most female academic staff members are not part of research networks and they are unlikely to receive research grants. This is compounded by a lack of research experience, which is the major criterion for winning research grants. Women, especially junior academic staff, do not meet the criteria and fail to win most research grants, which are highly competitive.

In the case of Addis Ababa University, different barriers to the low rate of female participation in leadership are identified. The limited number of female academic staff at the university, the negative attitude of some colleagues and the time limitations in balancing private and leadership roles are some of the factors identified (Addis Ababa University, 2015b). Other

contributing factors include family responsibilities and other social obligations, which consume a considerable amount of the time available to female academics.

In order to ensure gender equality in their activities, higher education institutes have taken different organizational policy measures. Addis Ababa University adopted a gender policy in 2015. The overall objective of which is to address gender imbalances in all areas of the university, such as academic work, research, community services and decision-making bodies so that a gender-responsive environment can be guaranteed or secured. The focus areas of the policy are: incorporating gender into the curriculum; putting in place gender-responsive staff recruitment, training, scholarship and promotion; promoting the participation of female academic staff in university research, publication and dissemination efforts; attaining a gender balance in the enrolment, access, retention and performance of students; and the appointment of a gender focal point who can follow up on the proper implementation of the gender policy.

The three universities have established gender offices within their organizational structures. The gender offices operate under the Office of the President to whom they are accountable. The activities of the gender offices include: mainstreaming gender in the teaching-learning, training and research activities, and community services of the universities; encouraging the sharing of experiences and learning from each other through the involvement of internal and external stakeholders; establishing linkages with national and international governmental and non-governmental stakeholders working on gender issues; and establishing and strengthening gender-related networking, partnerships and think tanks.

However, in the three universities, the mechanisms and channels intended to bring female internal or external stakeholders together, and to foster their involvement and relationships in line with the entrepreneurial agenda do not seem to be properly applied. The survey responses of 88 per cent of Addis Ababa University participants clearly indicated that the objective of harnessing women's full potential to promote the entrepreneurial agenda of the university is not realized. The same challenges in delivering on the gender equality commitments of the other two universities can be deduced from the information given by the respondents.

Figure 2.2
Organizational capacity: funding, people and incentives
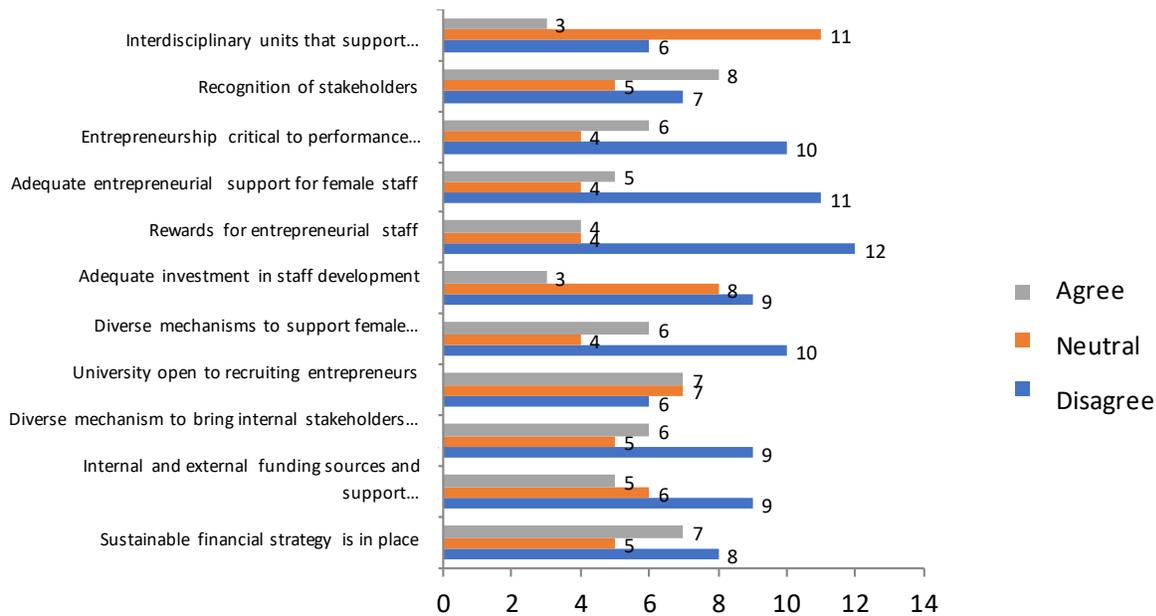
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

3.3 Entrepreneurship development in teaching and learning

An entrepreneurial university offers a wide range of opportunities for innovative teaching and learning with the overarching aim of developing an entrepreneurial mindset across all study programmes. However, this dimension of higher education does not seem to have received adequate attention in the universities. According to the views of Addis Ababa University respondents (100 per cent) and Bahir Dar University respondents (83 per cent), the two institutions are underperforming in this area. On the other hand, the majority of respondents from Haramaya University (67 per cent) agree with the statement that the university is structured in such a way as to strongly encourage and support the development of entrepreneurial mindsets and skills across the institution.

The integration of entrepreneurship into education has become more significant in recent decades. There is a growing recognition that university graduates have enormous potential for innovation and economic development. Researchers and experts encourage entrepreneurial education because of its perceived importance as a major engine for economic growth and job creation (Wong, Ho and Autio, 2005). Mobilizing students for entrepreneurial careers, enhancing their entrepreneurial skills and providing support for their business start-ups are considered important. An increasing number of universities in different countries are thus engaged in the development of programmes to enhance a range of entrepreneurial skills among graduates (Hoog and Skoumpopoulou, 2019).

The main goal of most entrepreneurial education is to develop a certain level of entrepreneurial competence. A narrow view of entrepreneurship takes the process of building

competence in entrepreneurship as encouraging students to establish their own company. However, the focus of entrepreneurship education should not be limited to the creation of new business ventures and subsequent new jobs, but should also involve developing the key competencies and mindsets of students, and, in turn, enabling them to be more creative and self-confident in whatever they undertake (Gibb, Haskins and Robertson, 2013; Valerio, Parton and Robb, 2014). Creating new organizations is then viewed as one of many different outcomes of entrepreneurship education (Lackeus, 2015).

A modular approach is adopted in different countries as an innovative method of teaching entrepreneurship. It is an emerging trend in educational thinking that shifts the traditional method of instruction to an outcome-based learning paradigm. It offers a variety of possibilities for designing curricula and improving entrepreneurial thinking by combining different modules and implementing them in many different individual and relevant ways, while also allowing for increased creativity in designing and transmitting knowledge, which is especially relevant for individuals (including teachers) without a background in business or management.

A modular curriculum was introduced in 2013 across all higher education institutions in Ethiopia. It was designed by focusing on the competencies that graduates need to attain and integrating knowledge and skills, with the aim of effectively preparing professionals for diverse job opportunities in the areas where the country needs skilled professionals. However, in Ethiopian universities, competences are not well identified, the organization of modules is weak and the teaching methods employed are dominated by the traditional lecture method with little emphasis on the world of work. The current modular system in universities is not providing entrepreneurial skills as expected. The universities are not providing non-cognitive knowledge or skills that will increase employability, such as skills relating to computer literacy, research or communication, lifelong skills or entrepreneurial skills (Ethiopia, Ministry of Education, 2018b).

An undergraduate course on entrepreneurship is offered to students of Addis Ababa University in a few select departments, such as management, accounting, agriculture and engineering. The Department of Management, which is under the College of Business and Economics, also offers MSc-level training in innovation management and entrepreneurship. It was recently decided that a course on entrepreneurship should be one of the common courses for all freshman students in all universities. Accordingly, the Ministry of Science and Higher Education prepared common teaching materials for the course in 2019. The material is aimed at bringing about behavioural changes among students and supporting them in the development of a self-employment mindset in their personal and professional lives.

The teaching material alone, however, cannot guarantee that graduates will acquire broader knowledge or that they will improve their skills. It is also important that entrepreneurship education is delivered with real entrepreneurs whenever possible and that a variety of teaching methods is used including case studies, games and simulations, reports of real experiences from start-ups and studies of business failures. Furthermore, it seems that the teaching materials need some enhancement to include dimensions of entrepreneurship not currently addressed by it.

Entrepreneurship education activities can be offered both within curricula and as extracurricular activities. In this regard, business incubators offer a wide variety of specialized business start-up support services, and the services demanded by students are readily available. The Technology Business Incubation Centre at Addis Ababa University, which was established

with this objective, provides tenants with work space, equipment, technological support and entrepreneurial skills. The Centre is also given the task of commercializing research outputs.

The three universities participating in this survey organize short-term entrepreneurship training for graduating students. However, this training is focused on the preparation of business plans and less emphasis is placed on the use of interdisciplinary projects, business simulations and other important elements of entrepreneurship. Focus should therefore be given to models of collaborative education that leverage the functional expertise of different units of the universities by creating joint learning environments for students in order to better prepare them for their professional careers.

Another issue that comes up with entrepreneurship teaching and learning is the need to incorporate research output in entrepreneurship education. In Ethiopian higher education institutes, the curricula are not revised on the basis of research findings and, as a result, courses do not incorporate entrepreneurial content to produce graduates with entrepreneurial mindsets. Universities are not geared towards developing employability and other lifelong skills among graduates, their strategies and teaching methods do not seem to adequately prepare students for the world of work. Students do not have ample exposure to real work environments or to teaching from practitioners in industry.

Research topics are driven by interests of the researchers and donors, with little or no serious relationships with prevailing policy concerns, and the universities have weak or no ties with technology users. There is no link between the research outputs of universities and private sector needs and, as a result, the research link between universities and industry is negligible. These have had a negative impact on the quality of education in such a way that most teaching at the universities has remained mainly textbook-based, with little inclusion of local practical knowledge or experiences (Ethiopia, Ministry of Education, 2018b).

Figure 2.3
Entrepreneurship development in teaching and learning
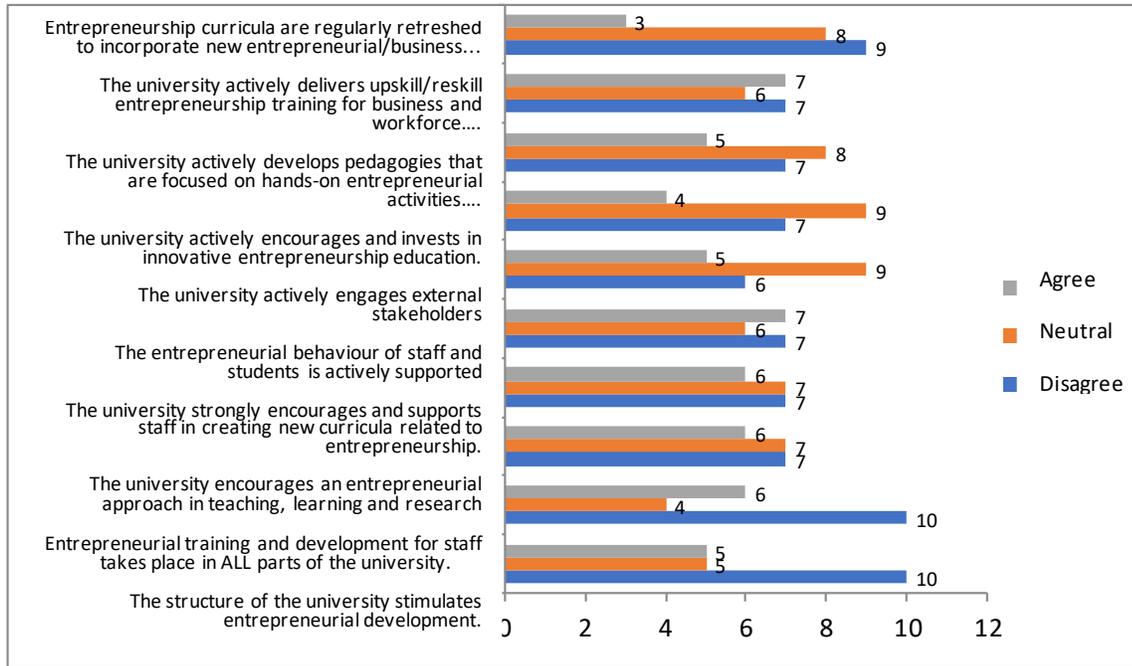
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

3.4 Pathways for entrepreneurs

Creating widespread awareness among staff and students of the importance of developing a range of entrepreneurial abilities and skills is an important function of an entrepreneurial university. This is not just about the abilities that support new business ideas, but also those that can support employability and career development. It is about creating value in many different areas of society. A number of mechanisms can be used to achieve this objective, including effective use of the university's homepage and social media, the organization of workshops and seminars, and short-term trainings.

Higher education institutes in Ethiopia organize workshops and seminars for staff and students on entrepreneurship. These programmes are mostly aimed at providing the participants with knowledge of how to establish their own enterprises. They are focused on the procedures and phases of establishing business enterprises and financing issues. The concept of entrepreneurship in an academic context, which may be applied to a wide range of other contexts, is not properly addressed in these programmes. Furthermore, the organization of these events is irregular and they mostly take place through individual initiatives rather than as institutional and planned activities.

For 75 per cent of Addis Ababa University respondents, either there are very few activities aimed at raising the awareness of staff and students of entrepreneurship or such activities do not take place in their institutions. According to 50 per cent of respondents from Bahir Dar University, the efforts of their university to promote awareness among its community are unsatisfactory. For the remaining half of respondents, the university is doing a commendable job by embedding

awareness-raising activities across the different units of the university. This notable discrepancy among the responses of academics from the same university may be a result of a weak internal communication system that fails to raise awareness of events and activities that taking place.

An entrepreneurial university provides support for individuals and groups to enable them to put entrepreneurial ideas into action. In this respect, business incubation is an important tool that can be used by universities to support new start-ups and spin-offs, with building links with industry another important facet. Incubators often provide free or subsidized premises, access to laboratories, research facilities and computing services, coaching, mentoring, training and access to financing. Universities should have on-site incubators with these services, or provide assistance to staff, students and graduate entrepreneurs in accessing external facilities offering this type of support.

The establishment of the Technology Business Incubation Centre by Addis Ababa University in 2017 was a step forward in creating opportunities for entrepreneurship development. During the inauguration ceremony, university officials mentioned the potential benefits of the Centre in fostering regional economic development by providing tenants with managerial assistance, technical support and shared access to basic office services and equipment. The Centre is also considered a gateway to the commercialization of research outputs. However, the information provided by the respondents of the questionnaire indicates that, four years after its inauguration, the Centre does not seem to be providing the envisaged benefits.

Figure 2.4
Pathways for entrepreneurs
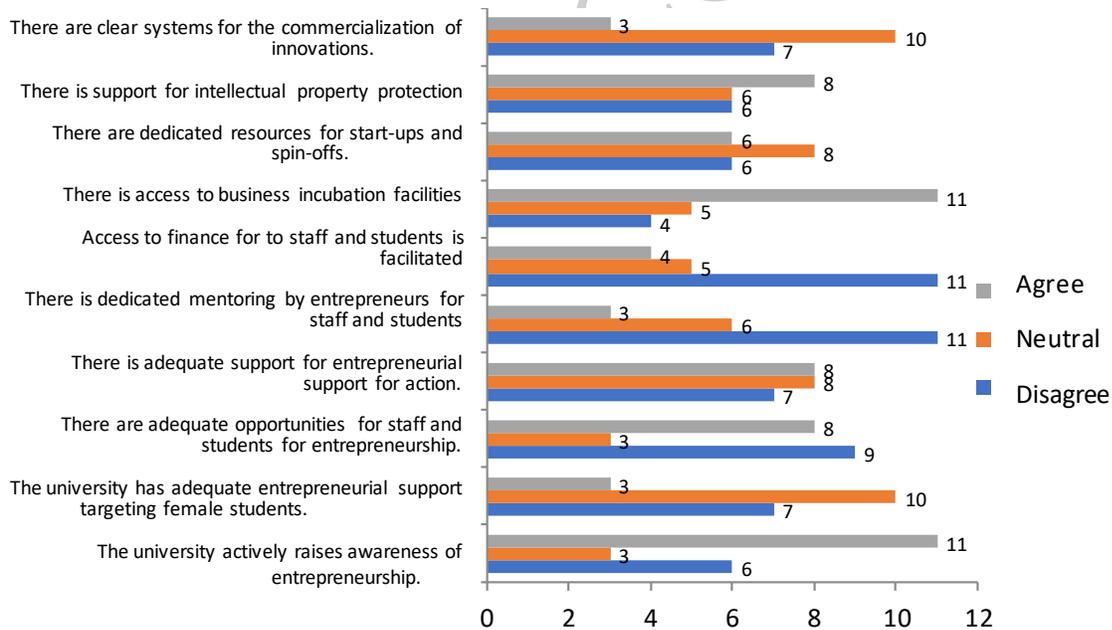
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

3.5   University-business and external relationships for knowledge exchange

There are a number of ways in which knowledge from universities can be exploited by firms and other organizations to generate economic and social value and the development of industry. For instance, knowledge outflow from a university may occur through research collaboration, graduation, or staff members changing their career and joining industry. On the other hand, the inflow of knowledge takes place through the hiring of new staff or lecturers, the exchange of students and researchers, and research collaboration.

The Education and Training Policy of Ethiopia addresses the need to cultivate the cognitive, creative, productive and appreciative potential of citizens by appropriately relating education to socioeconomic needs. This can come through the flow and application of university-generated knowledge to industry so as to meet the needs of the economy. The policy also has the objective of appropriately integrating education, training and research with development by focusing on research. Furthermore, it is stated in the Policy that higher education should be research-oriented, thereby enabling students to be problem-solving professional leaders in their fields of study and in relation to general societal needs.

Universities can generate added value from their relationships with the external environment. Universities in Ethiopia, however, have a poor performance record in establishing links with different actors in the various socioeconomic sectors. The Education Development Roadmap for the period 2018–2030 identified a disconnect between the activities of universities and those of the private sector, and indicated that universities have limited interactions with public industries. This has had a negative impact on the quality of education in such a way that most teaching at universities remains mainly textbook-based, with little inclusion of local practical knowledge or experiences. Most faculties are engaged in teaching only. Only a few faculties in older universities are involved in research.

The involvement of academic staff in community services is negligible. Professors are under enormous pressure with their teaching loads, which essentially deprive them of sufficient time for research and community service engagements. Even though universities are instructed to focus on research and community services, faculties are not actively engaged in research because of limited research time and incentives, and inefficient and distorted financial and procurement services at the university level. By concentrating so heavily on teaching, universities are ignoring research and failing to produce the output that society demands.

In the Education Development Roadmap, the following measures are proposed to improve research, technology transfer, university-industry linkage and the provision of community services to society by Ethiopian universities:

(a)   Encourage the hiring of industry leaders to give lectures in universities so that students can get real-life work experience;

(b)   Improve research infrastructure (laboratory, publishing, transport, etc.);

(c)   Promote local journals that meet international standards so that researchers can gain experience of publishing their research findings in peer-reviewed national and international journals;

(d)   Increase the budget for research, technology transfer and community service activities to at least 5 per cent of the total budget so as to engage more academic staff in research and community service activities;

(e)   Take measures to improve the university support system to increase the efficiency of finance, purchasing and other services provided to research and community services, which require more attention than those of other sections;

(f)   Develop a new and improved procurement system that facilitates the purchase of research and laboratory inputs;

(g)   Allow academic staff to allocate more time for research and community services. At least 15 per cent of staff time should be given over to community services.

3.5.1 Staff and student mobility

One important mechanism for knowledge exchange is the mobility of staff and students. This includes internships and programmes for teaching and research exchange. The incorporation of a period of practical training for students is a strategic measure that helps to improve the quality and relevance of education, especially in the field of engineering. Making students take an internship in industry gives them the opportunity to gain first-hand experience of professional working life and learn about the technical application of the methods they have learned in classrooms. They also gives them the opportunity to broaden their technical knowledge.

Another important benefit of practical training for students is that it serves as a tool to establish and strengthen links between universities and industry. With the objective of attaining this benefit, engineering faculties in Ethiopian universities have a qualified internship system, which is an important development that helps to enhance student knowledge (Belete, 2013). The effectiveness of such a system, however, depends on the full cooperation of university teachers whose inputs are invaluable. Besides their role in the in situ supervision of students, this system allows teachers to collaborate on projects with those working in industry.

3.5.2 Intellectual property and entrepreneurial activities

Over the past three decades, intellectual property protection for publicly funded university research has been the subject of intense policy debate in both developed and developing countries. Some people consider the dissemination of university research via patent licensing to be a model that facilitates economic and social returns from university research. Others have highlighted the potential for this model to generate unintended and deleterious consequences for innovation systems (Boettiger and Bennet, 2006; Montobbio, 2009; Sampat, 2006).

The landmark law that brought significant changes to university patenting is the 1980 Bayh-Dole Act of the United States. Proponents of the Act argued that there was a significant informational divide between the world of academia and the world of industry, making it difficult to implement university inventions in practice (Colyvas and others, 2002). The aim of the Bayh-Dole Act was to promote the commercialization of university research results that were seen to be going to waste (Fabrizio, 2006). Since the adoption of the Act, a number of countries have adopted laws permitting patenting of university research.

In Ethiopia, the issue of intellectual property protection for university-generated knowledge is addressed by the Higher Education Proclamation of 2019. The Proclamation requires universities to put knowledge and skills that have been utilized for academic purposes at the service

of the wider community. In guiding the wider dissemination of knowledge generated by universities, the Proclamation provides recognition for individual intellectual property rights and agreements on confidentiality.

At the institutional level, the 2011 research policy of Addis Ababa University has a section devoted to issues related to the ownership and management of intellectual property rights. The policy requires academic staff and student employees to disclose all potentially patentable inventions that occur in the course of their university activities or with more than incidental use of the university's resources. According to the policy, the university has the right to obtain titles to intellectual property developed as a result of support either received directly from the university or channelled through it. In the absence of support from Addis Ababa University, the ownership rights of intellectual property remain with the inventor.

The research policy of Haramaya University also has a section that deals with intellectual property rights. According to that policy, intellectual property rights over research outputs belong to the university. However, the policy states that the university should ensure that researchers benefit from intellectual contributions that they have made on the basis of the university's intellectual property guideline, the development of which was stipulated in the policy. Where the research concerned is partially or wholly based on an external financial source and where there is a desire for shared proprietorship of research outputs, the policy indicated that a different modality of ownership would be formulated and be part of the approval process.

Intellectual property management is among the contributions expected from the University-Industry and Technology Transfer Directorate at Bahir Dar University. The Directorate has been given the responsibility of coordinating and facilitating the development of institutional intellectual property policy and overseeing the implementation of that policy. The institutional intellectual property policy serves as a tool for successful collaboration between the university and its commercialization partners. It clarifies the ownership of the intellectual property resulting from the university's own or collaborative research and development activities, and the right to use it.

The senate legislation of the three universities incorporate sections that deal with the ownership of intellectual property rights. The provisions of the legislation include: university ownership of intellectual property rights; the rights of the intellectual property owners concerning publication of the research results and the use of the scientific data obtained; and the ownership of intellectual property in contract research.

The majority of Addis Ababa University respondents (63 per cent) do not agree with the statement that the university has a clear system through which external stakeholders can exploit the university's intellectual properties in entrepreneurial activities. In the case of Haramaya University, 50 per cent of respondents have a neutral view on the issue, while one respondent believes that intellectual property management is properly applied by the university. In a similar way, one respondent from Bahir Dar University is happy with the way intellectual property issues are handled by their university, while 75 per cent of the respondents either think that there are no practical steps taken by the university or have a neutral stand on the issue.

Figure 2.5
University-business/external relations for knowledge exchange
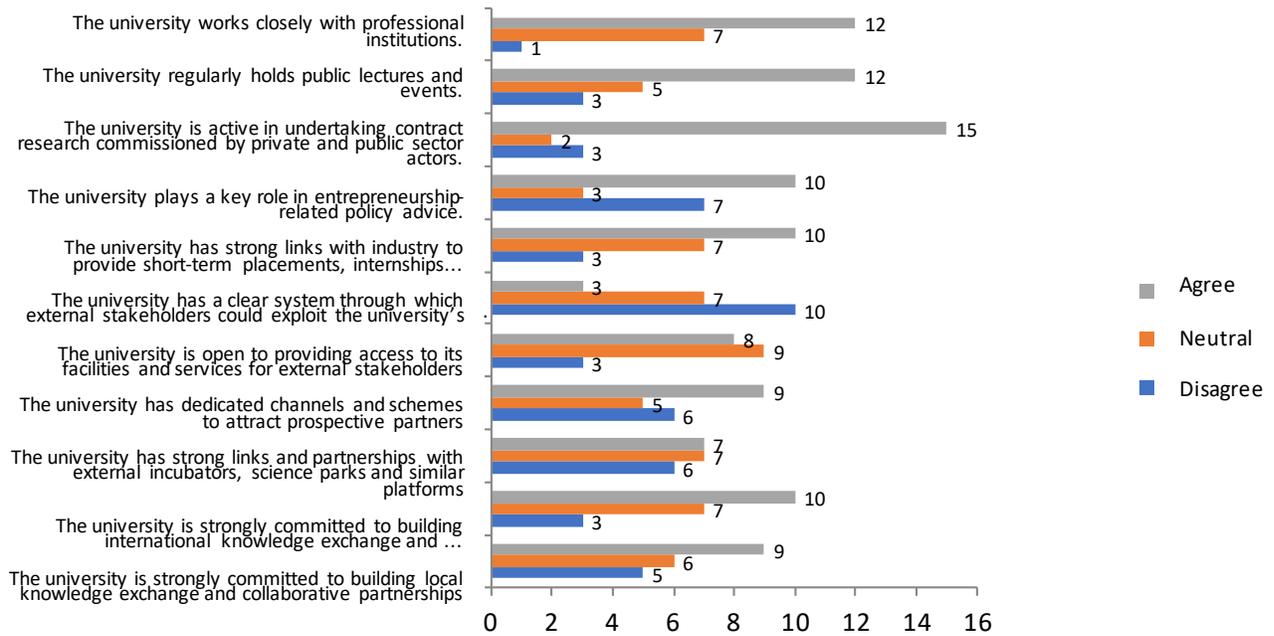
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

3.6 Internationalization of universities

The issue of the internationalization of universities has been the subject of increased interest in recent years. It involves integrating an international or global dimension into all areas of university activity, including the design and delivery of education, student recruitment, exchange and placement activities, research and development, knowledge exchange, and staff mobility and recruitment. The driving forces of university internationalization include the development of advanced communication and technological services, increased international labour mobility, greater emphasis on the market economy and trade liberalization, a focus on the knowledge society, increased levels of private investment and decreased public support for universities.

A review of the documents produced by the universities surveyed showed that they included internationalization in their strategies. These were focused on joint academic programmes, research collaborations, publications in international journals and the hosting of international workshops and conferences. In the views of 75 per cent of Addis Ababa University survey participants and 67 per cent of Haramaya University respondents, the institutions incorporated the objective of internationalization into learning and teaching strategies. The remaining respondents also believe that there are some elements of internationalization in the institutes' strategies.

In the area of staff mobility, the majority of Addis Ababa University respondents (88 per cent) are either happy with what the university is doing or think there is some effort from the university to encourage or support staff and student mobility. A similar view was reflected by 67 per cent of respondents from Bahir Dar University. Some Addis Ababa University staff benefit

from the university's collaboration programmes with other universities and undertake practical training, research and teaching in foreign universities. Students from the three universities also benefit from the Erasmus+ student exchange programme, which helps them to improve their communication, language and intercultural skills, and gain the soft skills highly valued by future employers.

The respondents from all three participating universities showed their highest level of satisfaction (70 per cent) in the area of raising the international profile and ranking of the universities, and promoting and showcasing their international activities and achievements through diverse channels. Deepening existing international partnerships in education and research and establishing new ones, as well as incorporating the objective of internationalization in learning and teaching strategies, are also among the areas that the respondents considered to be adequately addressed by the universities' strategies and activities.

To strengthen their training and research programmes, the different units of Addis Ababa University have joint research and training programmes with foreign universities and organizations. Through these joint programmes, faculty members of the university were trained abroad in different academic fields and foreign academic staff came to teach at the university. For instance, collaboration with universities in Sweden helped the university to establish a biotechnology programme unit that started offering training for masters in science degrees in 2006. On average, 12 postgraduate students join the programme each year. Most graduates of the programme are currently serving at higher education institutions and in federal and regional research institutions.

Addis Ababa University obtained funds for its doctoral programmes from international partners, including the Swedish International Development Cooperation Agency, the Netherlands Organization for International Cooperation in Higher Education, the British Council, the European Union, the World Bank, the United Nations Educational, Scientific and Cultural Organization, the Department for International Development of the United Kingdom of Great Britain and Northern Ireland and the United Nations Development Programme. In 2017, as part of a collaborative scheme between Addis Ababa University and Michigan State University, graduate students from the University of Michigan School of Public Health spent three months in Addis Ababa to put in place the country's first online cancer database at St. Paul's Hospital Millennium Medical College in partnership with the Ethiopian Public Health Institute.

Haramaya University also works with numerous international partners on several projects. A considerable number of foreigners come to the university as visiting scholars. Staff members of the university also travel abroad for conferences, workshops, short-term training programmes, mobility programmes and research. The university is currently actively involved in partnership programmes with foreign organizations. Over the previous 10 years, the university has implemented a number of international partnership projects in health and agriculture, and different staff capacity-building activities with more than 50 foreign universities and international organizations. One of these partnerships is the establishment of African Centre of Excellence for Climate Smart Agriculture and Biodiversity Conservation, in partnership with the Purdue Center for Global Food Security and with the financial support of the World Bank, at Haramaya University.

The Centre of Excellence was established with the objective of improving the quality of postgraduate education and research in East and Southern Africa to foster enhanced capacities to mitigate and adapt to the effects of climate change and weather variability, and ensure biodiversity conservation in the region. The multidisciplinary team of faculty members from academic units at

Purdue University in the colleges of Agriculture, Engineering and Liberal Arts participate in curriculum development, teaching and research for the Centre's programme.

The performance of the universities surveyed is weak in terms of attracting and recruiting international staff. The lowest score in this area was given by Addis Ababa University respondents, 75 per cent of whom think either that inadequate practical steps are taken to attract staff from abroad or that the measures taken are only moderate. The universities also have poor records of attracting students from abroad. The number of students who come from other African countries is negligible. The only exceptions are students from South Sudan and Somalia.

The Ethiopian Education Development Roadmap recommended the promotion of the internationalization of higher education institutes in order to increase the quality of higher education. Connecting Ethiopian higher education institutes with world class universities and research institutions is mentioned as a key strategy to increase the quality of education. The major components of the new strategies for internationalization identified by the Roadmap are: building the capacity of higher education institutes to attract students and staff from overseas, and research grants; increasing the internationalization of teaching and research activities without compromising the country's developmental needs; and encouraging staff and student mobility programmes.

Figure 2.6
Internationalization of universities
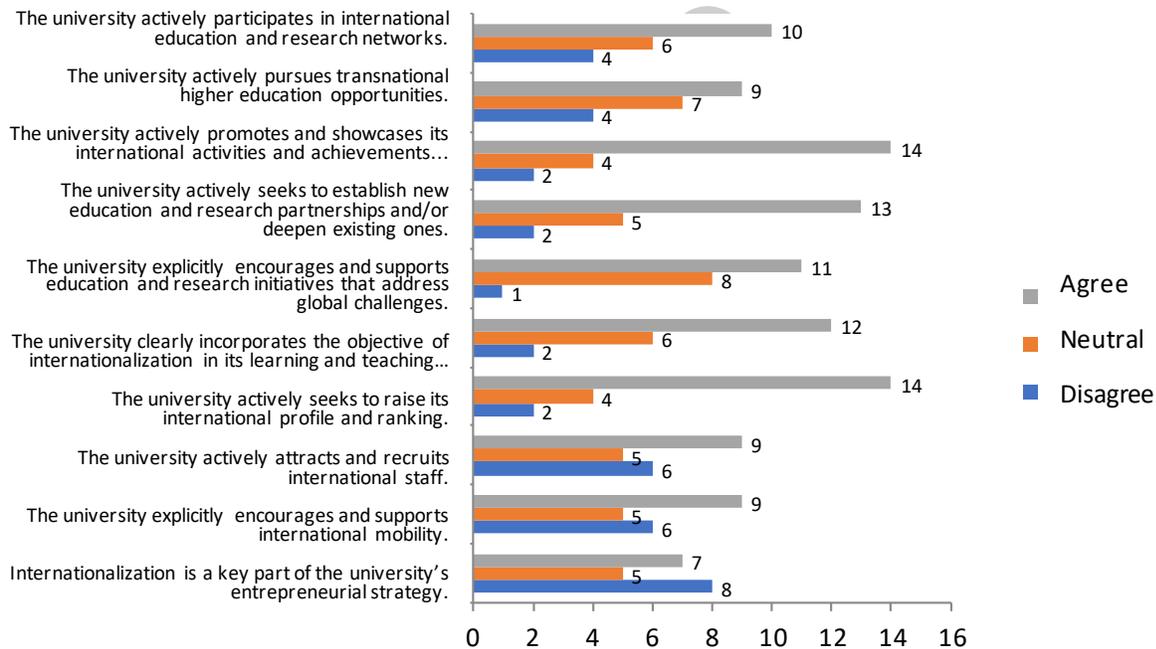
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

3.7 Measuring the impact of the entrepreneurial university

The absence or weakness of mechanisms for measuring the impact of entrepreneurship in the universities is clearly stated by the respondents. It can be seen from the answers that the systems that have been put in place to monitor and evaluate the universities' planned activities are not utilized for the purpose of measuring the impact of the universities' entrepreneurial activities. In the case of Addis Ababa University, 75 per cent of respondents do not agree with the statement

that the university has put in place clear guidelines and systems to record, measure and review the outcomes of its entrepreneurial strategy on a regular basis. The remaining 25 per cent have a neutral view on the issue.

From the documents reviewed, it can be seen that Addis Ababa University has created a system for the regular monitoring and evaluation of its projects. The Office of Strategic Planning is the organ of the university with responsibility for overseeing the activities. The university has an automated system to collect data on a daily, weekly, monthly, quarterly, biannual and annual basis. The automated system is used to regularly monitor and evaluate the performance of individuals, teams, units, offices and directorates, as well as the top management of the university in accordance with their tier structure and in line with the stated objectives. However, the problem is the lack of focus on measuring the impact of the entrepreneurial activities of the university.

In the same way, Haramaya University uses both formal and informal reports, as well as on-site observations, to monitor whether the university is functioning in accordance with its plans. Reports indicate that there is a hierarchical cause-and-effect relationship for activities at the individual level, department level, directorate/college/institute level, programme level and university level. The president, vice-presidents, deans, directors and other responsible bodies can conduct a site visit or observation of their respective units lower down in the hierarchy at any time. The Strategic Management and Institutional Transformation Directorate conducts supervision at least once per quarter. The performances of Haramaya University, from the department level to the institutional level, are evaluated every quarter. For some indicators, such as the satisfaction levels of stakeholders and customers, the Strategic Management and Institutional Transformation Directorate may conduct formal independent surveys to measure the level of achievements or aggregate and generalize the results of specific surveys carried out in units further down in the hierarchy.

At Bahir Dar University, the Planning and Programme Directorate, in collaboration with the university's top management, is responsible for leading and coordinating the quarterly, biannual and annual monitoring and evaluations made at all levels of the university. Surveys, personal observations, site visits and regular reports from directorates and academic units are used for evaluation purposes.

However, from the responses of the staff members who participated in the survey, it can be presumed that the metrics used for impact measurement do not take into account important factors such as teaching and learning outcomes, the employability of graduates and labour market performance, the university's contribution to local economic development, graduate entrepreneurship and the impact of the broader entrepreneurial and innovation agenda, such as social and cultural dimensions.

Figure 2.7
Measuring the impact of the entrepreneurial university
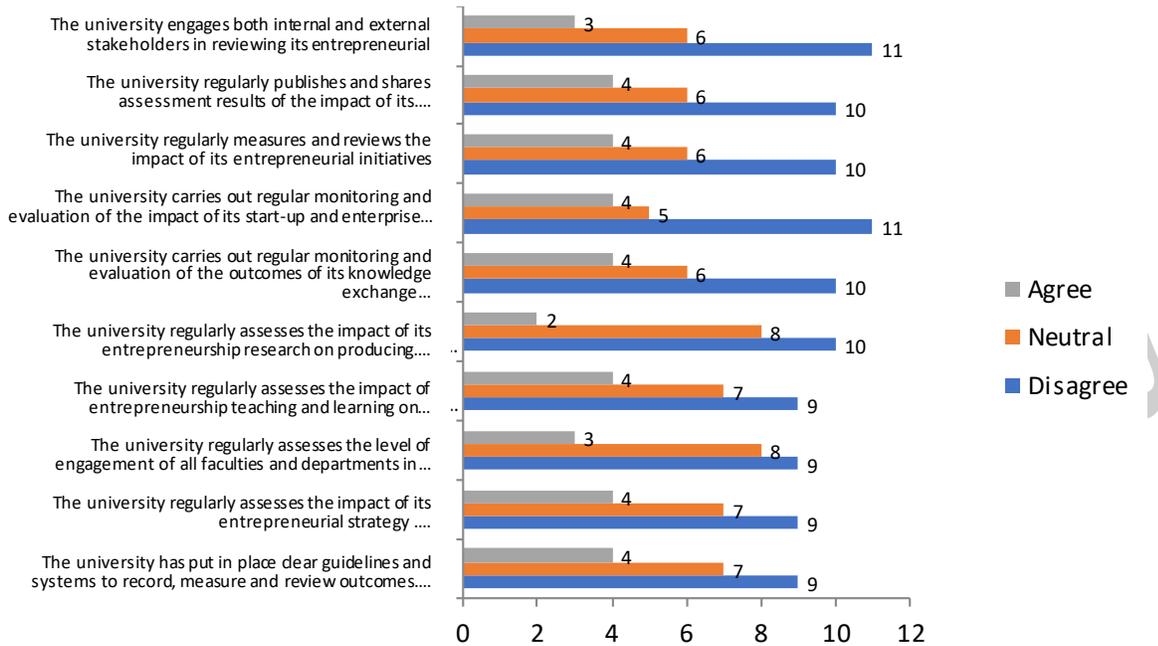
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ethiopia, 2021.

4.   Conclusions and the way forward

Ethiopia has made huge strides in expanding the higher education system that have brought a significant increase in the total number of enrolments and diversified the fields of study. The undergraduate curricula have been harmonized, a modular teaching system has been introduced and thematic research programmes have been developed. Furthermore, there have been developments in stakeholder participation in programme and thematic research development and in creating quality assurance mechanisms to enhance and ensure the quality of higher education.

Some elements of entrepreneurship development are included in the strategies of Addis Ababa University, Haramaya University and Bahir Dar University. The development of entrepreneurial competences and skills, the strengthening of links between universities and industry, and the provision of demand-driven and transformative community services and support for business start-ups are among the objectives of the universities' strategies. There are also some attempts by the universities to coordinate entrepreneurial activities through existing units or through the creation of new units, the mandates of which include supporting entrepreneurship.

However, the universities are overreliant on government funding for their operations, which has become one of the major factors limiting the advancement of their entrepreneurial agendas. The budget is mainly consumed by teaching and learning activities with little left for research, technology transfer or community services. The universities also face challenges in the use of the government budget owing to the inadequacy of the funding and lack of flexibility in its use. Although diversifying sources of financing is among the focus areas of the universities, little progress has been made so far in this respect.

The universities also face a serious shortage of qualified academic staff and there is a lack of sufficient and well-established laboratories and workshops. It is also rare to find industry leaders who are involved in university teaching and can give students real work experience. These gaps in the teaching and learning process have had a negative impact on the quality of education in the institutes, and producing university graduates with balanced cognitive and non-cognitive skills and high-level thinking skills has become a challenge.

The universities have limited interactions and collaboration with industry. This has created a disconnect between the knowledge and skills possessed by university graduates and the knowledge and skills demanded of industry. This problem, coupled with the low quality of academic staff and inadequate educational infrastructure, has resulted in poor quality graduates with a low chance of employability. Recent initiatives to involve stakeholders in curriculum design and strengthen university interactions with industry can help to rectify the deficiencies and help universities to encourage and support the development of entrepreneurship.

The academic staff who participated in the present study do not have a common understanding of university entrepreneurship. This is a reflection of the insufficient efforts of the university leadership to create awareness among staff of the role of universities in developing entrepreneurship and what it means for universities to be entrepreneurial. The prevailing concept of entrepreneurship among the staff is limited to the creation of new businesses, while only a few of them understand it from a broader perspective. Although entrepreneurship includes providing support from the pre-start-up phase of enterprises to the growth phase of business development, it is, in fact, much broader in scope.

The recently launched incubators at the universities can give significant support to developing entrepreneurship and sustaining rates of innovation. The units can be used to strengthen strategic partnerships between universities and industry and to foster entrepreneurial exploration. They can also help to attract and retain entrepreneurial staff members, while allowing students to develop hands-on entrepreneurial skills. The incubators can also serve the interests of graduating students with marketable ideas who are looking for connections to the marketplace.

The study uncovered the weak internal communication among different units of the universities. This implies a lack of collaboration among internal stakeholders that has a negative impact on academic entrepreneurship. The study also revealed that, despite the existence of policy provisions allowing universities to act autonomously, there is a high degree of interference by the Government, thereby creating barriers to their entrepreneurial activities.

The findings of the present study offer insights into the nature of entrepreneurship-related challenge of universities in Ethiopia. The evidence presented in the present study shows that the higher education system in Ethiopia has to become more entrepreneurial to support the economic, social and cultural development of the country. Taking into consideration this close link between university entrepreneurship and development, the following key recommendations are provided to Ethiopian policymakers and university leaders:

- Adopt a broader view on entrepreneurship. It is necessary to create a shared understanding of entrepreneurship among university staff and students that goes beyond business creation. It should be interpreted as including all activities aimed at fostering entrepreneurial mindsets, attitudes and skills and covering a range of aspects such as idea generation, start-ups, growth and innovation. This broad conceptualization of entrepreneurship should be used as a basis for designing

institutional strategies, developing internal organizational structure of universities and forging collaborations with stakeholders.

- Promote interdisciplinary programmes. Such programmes allow students to learn different subjects by making connections between ideas and concepts across disciplinary boundaries. Interdisciplinary courses allow students to develop critical thinking skills, be more creative and connect what they learn to a real-world context. Encouraging students to build their interdisciplinary pathways requires collaboration between different academic units of universities. University units should therefore get rid of organizational silos and their focus should be on how to develop entrepreneurial attitudes, skills and behaviours through interdisciplinary teaching.

- Give more autonomy to universities. Autonomous universities deliver more competent graduates, produce high quality research and are active in the provision of community services. Autonomy provides universities with a greater scope for launching entrepreneurial initiatives and enables them to play a key role in the national innovation system. When universities are allowed to pursue their mission without bureaucratic hurdles, they can introduce changes and innovations that reflect the needs of society.

- Introduce measures to bridge the gender gap in academic entrepreneurship. Gendered approaches focused on men make it harder for female academics to be active players in entrepreneurial initiatives. A female entrepreneurial dimension should therefore be incorporated into the creation of university policies and guidelines, and the institutes need to develop new approaches to engage more women in entrepreneurial activities.

- Revisit the criteria for academic promotion and recognition. There is a need to move away from basing academic promotion exclusively on publications and other criteria unrelated to entrepreneurship towards a promotion scheme that includes recognition for contributions to industry and entrepreneurial activities. This may convince academic staff to gravitate towards collaborative activities that generate value and promote entrepreneurship.

- More attention should be paid to knowledge exchanges and collaboration with external organizations. Universities can be a strategic asset if links with various innovation actors are strengthened and the transfer of knowledge and technology is enhanced and accelerated. Their engagement with business and communities in their core functions, funding and staff deployment provisions should be strengthened. The entrepreneurial initiatives of universities should strengthen their role as drivers of innovation and enhance their key role in regional and national economic development.

- Introduce performance-based funding mechanisms. The funding mechanism should be focused on the output side of universities. Output indicators may include the number of research publications, the number of degrees awarded and patents. Other output indicators would be the level of community engagement and success in generating additional funding from the different activities of the university.

CHAPTER 3. ADVANCING ENTREPRENEURIAL UNIVERSITIES IN GHANA

Executive summary

A survey on entrepreneurial universities in Ghana was conducted as part of a regional initiative to explore how universities are positioned to promote, nurture and drive entrepreneurship and business development. Seven universities, five public and two private, were surveyed using a questionnaire designed based on the Guiding Framework for Entrepreneurial Universities developed by the European Commission and OECD. The survey covered seven key areas: leadership and governance; organizational capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university. A total of 42 respondents including deans, department heads, research administrators, and senior lecturers from the natural sciences, engineering, social sciences and humanities were included in this survey.

Key survey findings

University leadership and governance support for entrepreneurship. the results show that entrepreneurship is clearly integrated as a major part of the university's mission and strategy. Overall, 69.2 per cent of respondents agreed with this statement. Well over 80 per cent of respondents agreed that there is a strong commitment at a high level of the university to implementing the entrepreneurial strategy, while close to 60 per cent agreed that the university has a clear model for coordinating and integrating entrepreneurial activities at all levels across the university. Similarly, close to 60 per cent of respondents agreed that the faculties, departments and units of the university are empowered to generate innovative ideas and seek ways to bring them to the market without seeking the approval of senior leadership.

Organizational capacity, people and incentives: over 85 per cent of the respondents from the private universities are positive about the existence of a sustainable financial strategy to support their entrepreneurial agendas. On the other hand, only about 46.34 per cent of respondents from the public universities are positive about the same attribute. Three universities involved in this survey were emphatic about their responses, with the entrepreneurial objectives being supported by a wide variety of internal and external funding sources and investment. These are Academic City University College, Ashesi University and the University of Ghana. Well over 60 per cent of those interviewed agreed that their university has diverse mechanisms and channels to bring internal stakeholders (including management, staff and students) together across levels and

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departments to foster their involvement and relationships in line with its entrepreneurial agenda, as well as being open to recruiting practitioners with business or entrepreneurship experience to take up teaching, training and research positions. Furthermore, only a third of the respondents agreed with the statement that the university has adequate entrepreneurial support targeting female staff and external partners. That is, 12.8 per cent agreed (measures applied with some good degree of success), 10.3 per cent strongly agreed (measures applied widely, for example, across the university and also with external linkages, yielding good results) and 7.7 per cent fully agreed, meaning that the university can be deemed a good practice or best case of an entrepreneurial university. Fewer than half of the respondents agreed (25.6 per cent agreed, 12.8 per cent strongly agreed and 7.7 per cent fully agreed) that there are adequate additional resources (e.g., budget, space and time), and clear rewards for staff who actively support and implement the university's entrepreneurial agenda.

Entrepreneurship development in teaching and learning: the survey results show that most of the respondents (61.6 per cent) from the universities sampled can attest to the fact that the university structure strongly stimulates developmental support tailored towards entrepreneurial mindsets and skills. About 72 per cent of the respondents agreed (30.8 per cent agreed, 28.2 per cent strongly agreed and 12.8 per cent fully agreed) that the university strongly encourages and supports staff in creating new curricula related to entrepreneurship, while 61 per cent of the entire sample interviewed agree that the university actively engages external stakeholders, including graduate entrepreneurs and business practitioners, in teaching, learning and research activities. There was a low response regarding the statement that entrepreneurial training and development for staff takes place in all parts of the university, as 15.4 per cent agreed, 10.3 per cent strongly agreed and 12.8 per cent fully agreed.

Pathways for entrepreneurs: a little over 50 per cent agree (20.5 per cent agreed, 10.3 per cent strongly agreed and 20.3 per cent fully agreed) that the university has adequate entrepreneurial support targeting female students. A similar response of a little over 50 per cent was observed for the statement that the university provides adequate opportunities for its staff and students to experience and/or practice entrepreneurship (23.1 per cent agreed, 20.5 per cent strongly agreed and 7.7 per cent fully agreed).

University-business/external relationships for knowledge exchange: a significant proportion (79.5 per cent) of the sample interviewed agreed that their university is strongly committed to building local knowledge exchanges and collaborative partnerships with industry, society and the public sector. The universities surveyed have strong links with industry to provide short-term placements, internships and industry project opportunities for their students, as indicated by 87.2 per cent of the sample interviewed.

The entrepreneurial university as an internationalized institution: overall, the respondents acknowledged that internationalization was an integral part of entrepreneurial universities. An overwhelming majority (87.2 per cent) agreed that their university actively seeks to raise its international profile and ranking, while 76.9 per cent agreed that their university clearly incorporates the objective of internationalization in its learning and teaching strategies.

Measuring the impact of the entrepreneurial university: overall, the respondents scored most of the impact statements below average. Approximately, 44 per cent of respondents agreed that their university has put in place clear guidelines and systems to record, measure and review

the outcomes of its entrepreneurial strategy on a regular basis, while 35.9 per cent of respondents agreed that their university regularly assesses the impact of its entrepreneurial strategy on the entrepreneurship development of its staff and students across the institution.

Budgeting and financing: generally, responses relating to the level of financing and investment in entrepreneurial universities were not encouraging, with approximately one third of the sample interviewed indicating growth in budget allocations for entrepreneurial activities, programmes, entrepreneurial support facilities, entrepreneurial skills training and staff development. There is a clear financing gap in almost all of the universities surveyed.

Conclusion and recommendations

In the study, the conclusion is reached that, overall, measures are applied with a good degree of success as regards university leadership and governance support for entrepreneurship, pathways for entrepreneurs, university–business/external relationships for knowledge exchange and the internationalization of the universities. Although there are measures in place, there has been only minimal implementation in respect of organizational capacity, incentives and support for entrepreneurship, impact measurement and entrepreneurship development in teaching and learning.

The recommendations for policymakers are: establish a dedicated fund at the national and university levels to support entrepreneurial programmes and activities; initiate business start-ups and academic spin-offs; promote the commercialization of research outputs and innovations; institutionalize monitoring and evaluation systems and institutional coordination mechanisms for entrepreneurial programmes and activities; mainstream gender and establish incentives and award schemes to recognize successful entrepreneurial initiatives by staff and students; and encourage the use of seasoned and respected business leader(s) to serve as entrepreneurs-in-residence.

1. Introduction

1.1 The policy context in support of advancing entrepreneurial universities

Twenty-first century knowledge-driven economies, with their attendant growing industrial competitiveness, call for huge investments in universities and, generally, robust governance for a tertiary educational system in Ghana that is locally relevant, fit for purpose and globally competitive. To put the Ghana case study of advancing entrepreneurial universities in context, the policy environment is scanned to establish the level of national commitment to advancing entrepreneurial universities. Ghana has signed onto the African Union Agenda 2063, a collective vision and road map for the transformation of Africa, with the aim of speeding up actions to catalyse a revolution in education and skills, and actively promote science, technology, engineering and mathematics, as well as the social sciences and humanities, to ensure that science meaningfully interacts with society and vice versa.

The Ghana Tertiary Education Policy (Ghana, Ministry of Education, 2019) provides a comprehensive framework with clear guidelines for the structure, planning development, regulations, operations and overall governance of the tertiary education system in Ghana. The policy emphasizes the need to train the workforce, in particular at universities, to meet labour market requirements, ensuring that such training is of a high quality and accessible to all Ghanaians. Although there is very little mention of entrepreneurial universities in the current Ghana Tertiary Education Policy, the policy document has some appreciable level of intentionality in terms of promoting entrepreneurial universities in Ghana.

The policy framework makes provision for internationalization as an integral part of a continuous process of change in higher education in general and universities in particular. The top five reasons mentioned in the policy framework for the internationalization of universities are to: improve students' preparedness to become global citizens; internationalize the curriculum; enhance the international profile of institutions; strengthen research and knowledge production; and diversify faculty and staff. The internationalization policy promotes common activities that institutions may engage, including study abroad programmes for students, faculty collaboration in research, the establishment of satellite campuses or franchising of private providers, curricula covering international issues and the attraction of foreign faculty members to campus.

With regards to entrepreneurship development in teaching and learning, as well as pathways for entrepreneurs, the Ghana Tertiary Education Policy identifies partnerships with industry as critical components of the developmental strategy of tertiary education institutions, including universities. The Government is supposed to create an enabling environment and incentive scheme for industry-academia partnerships and collaborations, creating a national platform for the two parties to engage and interact for their mutual benefit, including in providing funding support, enriching teaching and learning, and enhancing industry products and services through skills and technology transfers. This is critical to the development of a competitive national economy.

The policy on academic programme development seeks to create the human capital needed for national socioeconomic development and equip individuals with both physical and intellectual skills to enable them to become self-reliant and useful members of society. This policy objective

is to be achieved through tailored programmes, high-quality and relevant teaching, research and community service and development. The academic programmes should be aligned with national development goals and priorities. The conventional model of internal governance of the various universities in Ghana has broad stakeholder representation and is consultative in nature, with governing councils having responsibility for oversight to ensure the efficient governance and management of their respective institutions. At the university level, there are internal mechanisms in place to promote the transfer of academic knowledge to companies and foster socioeconomic development. In terms of funding, the Ghana Education Trust Fund Act 2000 (Act 581) (Ghana, 2000a) makes available funds for infrastructure, capacity-building for human resources and research in tertiary education institutions through the former National Council for Tertiary Education, now the Ghana Tertiary Education Commission.

The Education Strategic Plan 2018–2030, which is the third in a series of strategic plans that have been produced since 2000, promotes the inclusiveness of quality education in Ghana on the basis of the three main policy objectives of improving equitable access to and participation in inclusive education at all levels, improving the quality of teaching and learning and science, technology, engineering and mathematics subjects at all levels, and ensuring sustainable and efficient management, financing and accountability of education service delivery. To achieve these aims, the policy guidelines are focused on increasing enrolment at all levels of education and ensuring disability-friendly infrastructure, as well as improving the number of teachers, strengthening transparency in fund allocation and improving coordination with the private sector, non-governmental organizations and donor partners to ensure the smooth implementation of the Plan. The Plan covers a 13-year period and will be implemented in 4-year periods under the relevant national Medium Term Expenditure Framework 2018–2021.

The Akenten Appiah-Menka University of Skills Training and Entrepreneurial Development bill (2020) is before parliament, with the aim of establishing a university of skills training and entrepreneurial development in Kumasi, named after the late industrialist, Akenten Appiah-Menka. The Government has begun the process of converting the Kumasi campus of the University of Education, Winneba into a university of skills training and entrepreneurial development, which will be mandated to train teachers in practical skills and entrepreneurship.

As a nation committed to entrepreneurial development, Ghana has a national entrepreneurship and innovation programme that is aimed at creating an enabling conducive and business-friendly environment to stimulate the activities of enterprises and support start-ups, including young university graduates. In this regard, entrepreneurship education, in particular at the level of higher education, is seen as a potential cure for growing youth unemployment in developing economies, including Ghana (Baldry, 2016).

In an effort to safeguard intellectual property, there are intellectual property laws in Ghana governing copyright (the Copyright Act, 2005 (Act 690), Patents Act, 2003 (Act 657), Trade Marks Act, 2004 (Act 664), Industrial Designs Act, 2003 (Act 660) and Protection Against Unfair Competition Act, 2000 (Act 589)) (Ghana, 2000b, 2003a, 2003b, 2004, 2005). The national intellectual property rights policy and strategy, which are aimed at ensuring that innovators and technology development and transfer actors benefit from an improved intellectual property environment in Ghana, was launched in 2016.

1.2   A brief overview of the tertiary education system in Ghana

In order to understand the driving policies of the university environment, it is important to provide an overview of the tertiary education subsector in Ghana. The Education Act, 2008 (Act 778) places the educational system into three progressive levels, including tertiary education, which consists of education provided at universities, polytechnic institutions or colleges of education (Ghana, 2009), while the National Council for Tertiary Education Act, 1993 (Act 454) establishes the governance of the development of tertiary institutions, and provides information about norms and the monitoring of compliance with them by tertiary education institutions (Ghana, 1993).

The main regulatory authority, according to the new Education Regulatory Bodies Act, 2020 (Act 1023), is the Ghana Tertiary Education Commission (Ghana, 2020). The Commission is the result of the merging of the National Accreditation Board and the National Council for Tertiary Education. Under Act 1023, the Commission is tasked with achieving the main objective of regulating tertiary education in all its forms. In this vein, the Commission: advises the Government through the minister and tertiary institutions on development pathways for tertiary education; coordinates the planning of the tertiary education system in line with workforce requirements and national development; ensures the implementation of approved regulations and national standards; and provides accreditation for public and private tertiary education institutions and the programmes they offer.

1.3 Policy reform highlights and issues of national concern

The goal of the new tertiary education policy reform is to improve on the academic performance and governance of tertiary educational institutions. The aim is to provide a clear guideline for the overall structure, planning, development, regulation, operations, governance and accountability of the tertiary education system. The policy reforms cover the areas of: governance and management; institutional governance; the appointments and designations of principal officers; academic freedom; accountability in resource mobilization, grant management and utilization; equity and access; the expansion and establishment of tertiary education institutions; the provision of flexible and distributed learning; and diversification and differentiation.

Going back into history, the 1987 higher education reforms were focused on improving accessibility and the diversity of the curriculum to provide more education in science, technology, engineering and mathematics fields and vocational training. In 1991, the University Rationalization Committee provided recommendations that formed the basis of the Tertiary Education Project (1993–1998) supported by the World Bank. The project assisted the Government of Ghana in improving the quality and relevance of teaching and learning among the country's universities and polytechnic institutions through the provision of laboratory and teaching equipment for science, technology, engineering and mathematics, staff development and research funding, a computerized information management system and a quality monitoring system.

In 2004, a white paper on the Report of the Education Reforms Review Committee (Ghana, Ministry of Education, Youth and Sports, 2004) was produced, leading to the restructuring of the landscape of the tertiary education system. Some highlights of policy reforms in tertiary education included the following:

- The realignment of technical and vocational institutions under the Ministry of Education to create a Technical and Vocational Education Service for better governance (reforms in technical and vocational education and training).

- The transformation of teacher development and tertiary education through technology and innovation-based training (information and communications technology in education reforms).

- The transformation of educational strategies emphasizing the inculcation of curiosity, creativity and competence.

- Some polytechnic institutions (eight) have been upgraded to university status, a step aimed at enhancing technical training with an emphasis on excellence and professionalism in diverse technical and entrepreneurial programmes, under the Technical Universities Act, 2016 (Act 922) and the Technical Universities (Amendment) Act, 2018 (Act 974). Technical universities are the apex institutions in technical and vocational education and training for highly skilled human resources to drive economic growth.

The following are issues of national concern in human resource development at the tertiary education level:

- Information and communications technology infrastructure for e-learning: digital technology, mobile applications and smart learning solutions

- Improving the quality of higher education and the employability of graduates

- Proper course structuring, focusing, resourcing and the promotion of competency-based training

- Institutions must contact their graduates in the job market to find out how they are performing, and industrial connections must be encouraged during training

- Encouraging the private sector to finance research and technology through tax incentives and related measure

- Creating networks between universities, research institutions and industry to promote collaboration

- Systems to strengthen the relationship between academia, research and industry, such as the Ghana Innovation and Research Commercialization Centre, the Council for Scientific and Industrial Research, the Technology Development and Transfer Centre, technical and vocational education and training, and entrepreneurial and technical universities

- Enhancing the country's capacity to train personnel in emerging technologies, such as biotechnology, photonics, microelectronics nanotechnology, material science, and creative engineering

2. Objectives and methodology

2.1 Working definition of an entrepreneurial university

An entrepreneurial university should have a holistic human resources development agenda and institutional programmes with a special focus on developing entrepreneurial skills, competences and capabilities for national development. A key role of the entrepreneurial university is to create an entrepreneurial system, which involves visible leadership, clarity of purpose, the embedding of an entrepreneurial culture, capacity-building and an enabling environment (Herrmann and others, 2008). According to the relevant literature, entrepreneurial universities face numerous obstacles, including a lack of adequately trained faculty members, limited funding and resources, a poor institutional infrastructure and marketing constraints. There is a pressing need to promote and foster the growth of entrepreneurial universities through incubation centres and programmes to develop entrepreneurial skills in order to give students the creative and logistical space needed to set up viable businesses in the job market. Understanding the entrepreneurial system is critical to advancing entrepreneurial universities in Africa. Entrepreneurial universities are assessed by their leadership and governance structure, organizational capacities, culture of entrepreneurship, stakeholder partnerships and internationalization, among other criteria.

2.2 Study objectives

The objectives of the study were to:

- To review the steps taken by selected entrepreneurial universities to promote entrepreneurship

- To review the existing and emerging trends, policies, regulations, administrative processes and infrastructure designed to promote entrepreneurship

- To assess the impact of such changes on the mission of entrepreneurial universities

- To identify and review institutional requirements, including learning, research and innovation support infrastructure, and other key resources for the successful development of entrepreneurial universities

2.3 Methodological framework

To achieve the above-mentioned objectives, the purpose of the study is to investigate seven key areas of the entrepreneurial system, as featured in the Guiding Framework and also as captured by Mazzarol (2014). These include: leadership and governance; organizational capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university.

The questionnaire used in this survey was designed to generate information and data to inform national and regional processes on the steps needed to support university investments, efforts and the time devoted to entrepreneurship. It was not designed to assess how the universities are positioned to promote, nurture and drive entrepreneurship and business development. Based on experiences and insight about their respective universities, respondents were asked to indicate

the extent to which they agree with statements relating to the attributes of entrepreneurial universities using a Likert scale of 0 to 6:

- 0 = Fully disagree (the attribute does not apply at all or the measure has not even been discussed)

- 1 = Strongly disagree (some general discussions have happened, but no specific measure has been defined or practical step undertaken)

- 2 = Disagree (measures have been discussed and broadly defined but have not been adopted or practised)

- 3 = Neutral (measures are in place but only minimal implementation has taken place)

- 4 = Agree (measures applied with some good degree of success that you are proud of)

- 5 = Strongly agree (measures applied widely, for example, across the university and also with external linkages, yielding good results)

- 6 = Fully agree (the university can be deemed a good practice or best case of an entrepreneurial university. Measures are fully integrated across all faculties; they are well known by all and/or very successful. There is significant engagement and linkage with, and recognition by external stakeholders)

2.4   Data collection process

Based on the above-mentioned terms of reference, seven universities with varying decree of entrepreneurial focus were purposively sampled for the data collection. The selection considerations included the geographical spread, public universities compared to private ones, the programmes offered and infrastructural support for entrepreneurial training.

Per the study design in the terms of reference, at least five respondents were to be selected by the lead and focal management person of the selected universities to fill in the online survey and interview in Google Forms. For the data collection, a focal person at the management level was also identified from each of the purposively selected universities. The focal person helped to identify at least five people at the management level to be interviewed. A detailed work plan on how the consultancy was organized and executed with timelines is presented in the annex.

With the exception of the University of Cape Coast, which had 12 respondents, the rest of the universities surveyed had five respondents, which was the minimum requirement. Overall, the total sample of people interviewed was 42. The universities surveyed in Ghana are presented in table 3.1.

Table 3.1
Universities surveyed in Ghana

University	Type of university	Number of people interviewed
Academic City University College	Private	5
Accra Technical University	Public	5
Ashesi University	Private	5
Ghana Communication Technology University	Public	5
Kwame Nkrumah University of Science and Technology	Public	5
University of Cape Coast	Public	12
University of Ghana	Public	5
Total		**42**

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

2.5   Overview of selected universities

University of Ghana Business School

The mission of the University of Ghana Business School is to develop quality human resource capacities and leaders through the provision of world class management education and relevant cutting-edge research to meet national and global development needs. Its departments are: Accounting; Finance; Marketing and Entrepreneurship; Organization and Human Resource Management; Operations and Management Information Systems; and Public Administration and Health Services Management.

The University of Ghana Business School has international collaborations and cooperation with universities in Canada, China, Israel, Nigeria, Norway, the Republic of Korea, South Africa, Switzerland and the United Kingdom: Bergen University College (Norway), Covenant University, Ogun State (Nigeria), the Galilee International Management Institute (Israel), the Graduate Institute of International and Development Studies (Switzerland), Hanbat National University (Republic of Korea), Harstad University College (Norway), Hebei University of Economics and Business (China), Queens University, School of Policy Studies (Canada), SINTEF Technology and Society (Norway), the University of Cape Town (South Africa), the University of the Free State Business School (South Africa), the University of Reading (United Kingdom) and the University of South Africa (South Africa).

Ashesi University

This mission of Ashesi University is to drive an African renaissance by educating ethical and entrepreneurial leaders. Ashesi combines a rigorous multidisciplinary core with degree programmes in computer science, business administration, management, information systems and engineering. The university is involved in integrated community service, diverse internships and real-world projects to prepare students to develop innovative solutions for the challenges facing their individual communities, countries and the continent as a whole. There are recruitment services, which involve cooperative efforts with the online job posting and resume search system of College Central Network, Inc. The Ashesi career fair creates a great platform to source top talent and also helps companies to create brand awareness and foster great partnerships.

Academic City University College

The university's mission is to educate future-oriented leaders who can solve complex problems innovatively within an ethical, entrepreneurial and collaborative environment. The university is focused on experiential and active student learning, supplemented by an emphasis on social and emotional learning and ethical decision-making, and prepares students to compete with globally trained talents. The programmes offered by Academic City University College include Engineering, Technology, Business and Communication Arts. Some of its global partners are the University of Dayton. Millerville University and Engineers without Borders USA.

Accra Technical University

Under the Technical University Act, 2016, (Act 922), Accra Polytechnic became Accra Technical University and was given technical university status, alongside eight other polytechnic institutions. The university has five faculties: the Faculty of Engineering; the Faculty of Built Environment; the Faculty of Applied Sciences; the Faculty of Applied Arts; and the Faculty of Business. It also has 16 departments. It offers hands-on and competency-based training in diverse fields of engineering and industrial practice.

University of Cape Coast

The University of Cape Coast has established entrepreneurship centres and trained students in entrepreneurship and small enterprise development. It enables students to start their own businesses and contribute to national development. The entrepreneurship centres have three units within the Centre for Entrepreneurship and Small Enterprise, namely: Entrepreneurship Education; Research and Publications; and Business Incubation. The Centre is working in partnership with the Government to implement a three-year Exim Bank project on a Graduate Enterprise Project Initiative. Over 10,000 students are following a course on entrepreneurship to provide them with an entrepreneurial mindset as part of their training.

An overview of the universities surveyed is presented in table 3.2.

Table 3.2
Overview of the universities surveyed in Ghana

Universities	Mission	Aims/objectives	Programmes	International networks
Academic City University College	To educate future-oriented leaders who can solve complex problems innovatively within an ethical, entrepreneurial and collaborative environment.	To create an atmosphere that will place students at the centre of the learning experience, surrounded by a strong collection of like-minded people whose primary goal is to push the boundaries of academia and innovation. Academic City is changing tertiary learning in Africa, with activity-based learning and premium teaching talent, complemented by a one-of-a-kind campus. Entrepreneurial spirit: ability to challenge the norms and seek out change that can innovate and make progress. Problem-solving rigour: applying theoretical knowledge to analyse complex problems and devise practical solutions.	Academic City University College runs under the faculties of Engineering and Informatics, and Business and Social Sciences, with four areas of study, namely engineering, business, information technology and communication arts. They offer undergraduate, diploma and certificate courses.	Coventry University is a partner to Academic City University College. It has an affiliated programme with Sikkim Manipal University. It was established in 2009 and over 3,000 students from over 23 countries in Africa have graduated. It has taken steps to partner with international universities, one of which is Worcester Polytechnic Institute. Also, one student had the opportunity to do her internship in South Africa. In lieu of strengthening the research capacity of lecturers, the university organized a research writing seminar for its lecturers, which was moderated by a visiting professor from a university in the United Kingdom.
Accra Technical University	Continuously producing graduates that are fully equipped for the world of work and providing technological solutions through applied research to industry and communities.	To provide higher education in engineering, science and technology-based disciplines, technical and vocational education and training, applied arts and related fields.	It offers a wide range of programmes under the following options: 1. Bachelor of Technology programmes (18–24 months and four-year straight degree) 2. Higher National Diploma programmes (three years) 3. Non-tertiary programmes 4. Other professional programmes 5. Language proficiency programmes There are five faculties; the Faculty of Engineering; the Faculty of Built Environment; the Faculty of Applied Sciences; the Faculty of Applied Arts; and the Faculty of Business.	Vaasan Ammattikorkeakoulu – the University of Applied Sciences, Finland The University of Maryland Eastern Shore, United States The Partnership for Applied Science The Hague University of Applied Arts and Sciences Malta College of Arts, Science and Technology Tianjin Economics and Trade School, China
Ashesi University	To drive an African renaissance by educating ethical and entrepreneurial leaders.	The university has eight learning goals: 1. Ethics and civic engagement; 2. Critical thinking and quantitative reasoning; 3. Communication; 4. Leadership and teamwork; 5. Innovation and action; 6.Curiosity and skill;	Teaching and learning is across four departments: Humanities and Social Sciences; Business Administration; Computer Science; and Engineering. Only four-year bachelor's programmes are offered.	Member of 1. Association of Commonwealth Universities 2. Global Business School Network 3. U7+ Alliance Exchange programmes with a number of universities in the United States, France, Canada and Sweden, among other countries.

Universities	Mission	Aims/objectives	Programmes	International networks
		7.Technological competence; 8. Professionalism.		Participation in the global "Map the System" challenge and various education networks, for example, the Open Society University Network.
Ghana Communication Technology University	To be a centre for academic excellence, providing an enabling environment for quality teaching and learning, research, intellectual creativity, innovation and service to the community.	To provide a viable world class centre for higher education in technology education and to undertake research in accordance with its aims to promote education and provide global consultancy services.	The university runs undergraduate and graduate programmes, professional courses, diploma programmes and certificate programmes. There are three faculties: the Faculty of engineering; the Faculty of Computing and Information Systems; and the Faculty of IT Business.	It has partnerships with: Aalborg University, Denmark; the Staffordshire University and Coventry University, United Kingdom; CASS European Institute of Management Studies; Wildau University. Germany; and Maharaja Agrasen University and M.S. Ramaiah University of Applied Sciences, India.
Kwame Nkrumah University of Science and Technology	To advance knowledge in science and technology by creating an environment for undertaking relevant research, quality teaching, entrepreneurship training and community engagement to improve quality of life.	To provide an environment for teaching, research and entrepreneurship training in science and technology for the industrial and socioeconomic development of Ghana and beyond. (see: www.lstmed.ac.uk/kwame-nkrumah-university-of-science-technology-knust.)	The university offers undergraduate, graduate, postgraduate programmes, diploma programmes and distance learning programmes under six colleges: the College of Agriculture and Natural Resources; the College of Humanities and Social Sciences; the College of Engineering; the College of Science; the College of Art and Built Environment; and the College of Health Sciences.	1. Texas International Education Consortium and Iowa State University (as part of the United States State Department Bureau of African Affairs' University Partnerships Initiative). 2. Academisch Medisch Centrum bij de Universiteit van Amsterdam 3. Charite – Universitaetsmedizin Berlin 4. London School of Hygiene and Tropical Medicine 5. Technical University of Munich
University of Cape Coast	To provide quality education through the provision of comprehensive, liberal and professional programmes that challenge learners to be creative, innovative and morally responsible citizens.	To prepare productive citizens and future leaders who can serve the national and global community in diverse ways.	The university offers non-degree programmes, and undergraduate, graduate and doctorate degree programmes under four faculties: the colleges of Humanities and Legal Studies, Education Studies, Agriculture and Natural Sciences, and Health and Allied Sciences.	University partners include: Shiv-India Institute of Management and Technology University of Newcastle, New South Wales Ecole Polytechnique d'Abomey Calavi Simon Fraser University Jiangsu University It is an accredited member of the Association of Commonwealth Universities.

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Universities	Mission	Aims/objectives	Programmes	International networks
University of Ghana	To create an enabling environment that makes the University of Ghana increasingly relevant to national and global development through cutting-edge research, as well as high quality teaching and learning.	To produce the next generation of thought leaders to drive national development.	The university has four colleges: the College of Basic and Applied Sciences; the College of Education; the College of Health Sciences; and the College of Humanities. It runs undergraduate, graduate, doctorate, international and distance programmes.	It has established links with universities in Europe and North America. It is a member of the: 1. International Association of Universities; 2. Association of Commonwealth Universities; 3. Association of African Universities; 4. League of World Universities; 5. Norwegian Universities' Committee for Development Research and Education; 6. Council for International Educational Exchange; 7. International Student Exchange Programmes; 8. Commonwealth Universities Student Exchange Consortium (see: www.ug.edu.gh/content/associations-institutional-affiliations).

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3. Survey results

This chapter presents results and findings from the analysis of data collected on the seven universities surveyed. In total, eight sections are covered: leadership and governance; organizational capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university–business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; measuring the impact of the entrepreneurial university; and mechanisms, entrepreneurship supporting structure, services and programmes and financing.

3.1 Leadership and governance

To be an entrepreneurial university, the culture, leadership and governance system must all promote entrepreneurship. Using the Guiding Framework developed by the European Commission and OECD, factors that relate to the leadership and governance of the universities surveyed are explored. An entrepreneurial university must have a leadership and governance structure that includes entrepreneurship as a major part of its strategy. There must also be a commitment at a high level to implementing the entrepreneurial strategy, and the university must have a model for coordinating and integrating entrepreneurial activities at all levels across the university. In addition, the faculties and units must have the autonomy to act independently and the university must be a driving force for entrepreneurship development in the wider regional, social and community environment.

Table 3.3 presents the responses relating to statements on leadership and governance. The results show that 41 per cent of the respondents fully agree that entrepreneurship is clearly integrated as a major part of the university's mission and strategy, while 15.4 per cent strongly agree and 12.8 per cent agree with the statement.

Table 3.3
Leadership and governance systems of the universities surveyed in Ghana
(Percentage)

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
1.1. Entrepreneurship is clearly integrated as a major part of the university's mission and strategy.	0.0	7.7	2.6	20.5	12.8	15.4	41.0
1.2. There is strong commitment at a high level of the university to implementing the entrepreneurial strategy.	0.0	10.3	0.0	15.4	20.5	17.9	35.9
1.3. The university has a clear model for coordinating and integrating entrepreneurial activities at ALL levels across the university.	2.6	7.7	0.0	30.8	17.9	20.5	20.5
1.4. Faculties, departments and units have adequate autonomy to act on their entrepreneurial initiatives.	2.6	20.5	5.1	15.4	17.9	20.5	17.9
1.5. The university is active in developing initiatives and programmes that drive entrepreneurship development in the wider regional, social and community environment.	2.6	2.6	5.1	17.9	23.1	28.2	20.5
1.6. Faculties, departments and units are empowered to generate innovative ideas and seek ways to bring them to market without seeking the approval of senior leadership.	12.8	0.0	15.4	12.8	15.4	28.2	15.4
1.7. The university is a major provider of products and other innovations that have supported business development	0.0	2.6	7.7	23.1	30.8	25.6	10.3

and/or improved the lives of people in the community.							
1.8. The university is active in providing critical consultancy and advisory services on entrepreneurship issues in the wider regional, social and community environment.	0.0	0.0	5.1	20.5	35.9	25.6	12.8
1.9. The university is active in providing critical support services to its surrounding communities (e.g., health, engineering, agricultural services).	0.0	0.0	0.0	28.2	38.5	20.5	12.8
1.10. The university's research and training programmes for supporting businesses and/or addressing challenges in the local community are well established and recognized by the community.	0.0	0.0	10.3	35.9	23.1	20.5	10.3

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

A similar trend was observed in the results on the integration of entrepreneurship in the university's mission and strategy in response to the statement that there is strong commitment at a high level of the university to implementing the entrepreneurial strategy. Overall, when respondents were asked to what extent they agree with that statement, 20.5 per cent agreed, 17.9 per cent strongly agreed and 35.9 per cent fully agreed. Regarding the statement that the university has a clear model for coordinating and integrating entrepreneurial activities at all levels across the university, 17.9 per cent agreed, 20.5 per cent strongly agreed and 20.5 per cent fully agreed. Regarding the statement that the faculties, departments and units of the universities have adequate autonomy to act on their entrepreneurial initiatives, 17.9 per cent agreed, 20.5 per cent strongly agreed and 17.9 per cent fully agreed.

Overall, 17.9 per cent of respondents fully agreed that their faculties, departments and units have adequate autonomy to act on their entrepreneurial initiatives. About 20.5 per cent of the entire sample interviewed strongly agreed with that statement, while 17.9 per cent of the respondents agreed. The results show an appreciable level of disagreement among the public universities in terms of whether the autonomy of faculties, departments and units is adequate to act on their entrepreneurial initiatives. The private universities rather showed a high level of agreement with the statement.

Overall, 20.5 per cent of the sample interviewed fully agreed with the statement that the university is active in developing initiatives and programmes that drive entrepreneurship development in the wider regional, social and community environment. In addition, 28.2 per cent and 23.1 per cent strongly agreed (measures applied widely, for example, across the university and also with external linkages, yielding good results) and agreed (measures applied with some good degree of success that you are proud of) respectively. Close to 60 per cent of the respondents agreed (15.4 per cent agree, 28.2 per cent strongly agree and 15.4 per cent fully agree) with the statement that faculties, departments and units at the university level are empowered to generate innovative ideas and seek ways to bring them to market without seeking the approval of senior leadership. Comparatively, the public universities had a relatively low percentage of positive responses to that statement.

With regard to the provision of critical consultancy and advisory services on entrepreneurship issues in the wider regional, social and community environment, the overall result showed that 35.9 per cent agreed, 25.6 per cent strongly agreed and 12.8 per cent fully agreed. The implications are that much work needs to be done in the area of consultancy and advisory services on entrepreneurial issues at various levels of the governance system, including at the regional, national and community

or local levels. The universities are active in providing critical consultancy and advisory services on entrepreneurship issues in the wider regional, social and community environment. Again, over 70 per cent of the respondents agreed (38.5 per cent agree, 20.5 per cent strongly agree and 12.8 per cent fully agree) that their university is active in providing critical support services to its surrounding communities (e.g., health, engineering, agricultural services). Figure 3.3 shows the university-disaggregated results of responses to that particular statement. The results revealed that the private entrepreneurial universities surveyed have a relatively high level of agreement with the statement that the university is active in providing critical support services to its surrounding communities.

Figure 3.1
Weighted average response to statements relating to the leadership and governance of entrepreneurial universities
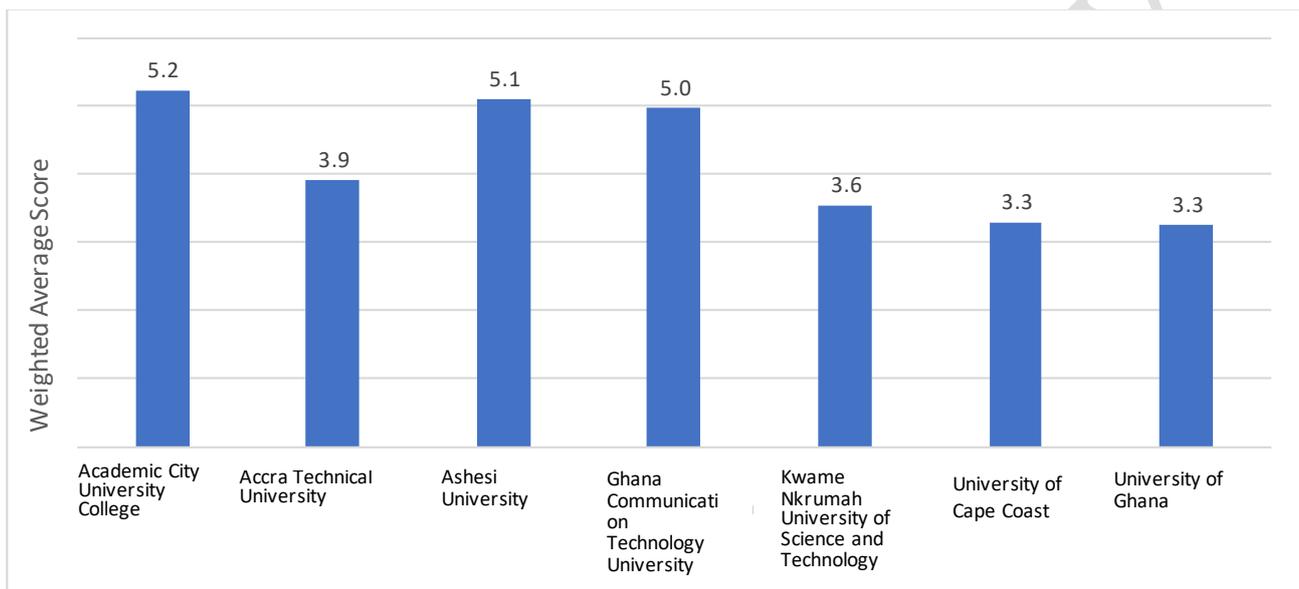
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Focusing on analysis at the university level, the survey results revealed varied leadership and governance systems across the universities surveyed, as shown in figure 3.1. Academic City University College had the highest weighted average score, followed by Ashesi and then Ghana Communication Technology University. Overall, all of the universities have leadership and governance systems with appreciable levels of knowledge of entrepreneurial relevance, and the faculties and units have the autonomy to implement entrepreneurial activities.

Examples of leadership and governance

Ashesi University provides grant funding for businesses in its system (students and alumni) through the Ashesi Enterprise Fund, and it has successfully launched a business incubator (Ashesi Venture Incubator) to support the businesses of recent alumni with funding and mentorship. Other initiatives, such as the Next Generation Cocoa Youth Programme (MASO) and the Ghana Climate Innovation Centre, have contributed to rural entrepreneurship and climate businesses, respectively.

Academic City University College has collaborations with farmers in the community to identify and find solutions to their problems. The university is constantly engaging with industry partners to bring them on board to help to bridge the gap between industry and academia.

Kwame Nkrumah University of Science and Technology has a dedicated unit (Centre for Business Development), with competent staff for promoting entrepreneurial activities. The introduction of the "One Department One Business Venture" initiative by the Vice-Chancellor of the university has empowered all departments to pursue and exploit entrepreneurial opportunities that fall within their purview. The university has a three-tier entrepreneurship training programme. The first tier provides that entrepreneurship as an academic course is compulsory for all students in either the 300 or 400 level. This academic aspect is handled by the university's School of Business. The second tier provides that departments are encouraged to refer students who show a deeper interest and passion in entrepreneurship practice to the Centre for Business Development that runs the business incubator and deals with the pre-incubation and incubation activities of start-ups. The third tier provides for the Centre for Business Development to see to the best financial arrangements for the scaling up of market-ready business start-ups nurtured in the incubator.

The University of Cape Coast organizes capacity-building programmes and advisory services for businesses and the surrounding communities. It has a strategy document on turning the university into an entrepreneurial university. Over the past five years, the Centre for Entrepreneurship has engaged in several training and consultancy services in collaboration with non-governmental organizations to support entrepreneurs in urban and rural settings. The initiatives for students also include business plan competitions and training in such areas as food processing and consumer goods. Feedback from training recipients suggests that there has been some impact. For example, the Building Expertise and Training project in Ghana has supported young entrepreneurs as they develop and grow. The University of Cape Coast has a business incubator that is open to all staff and students to assist them in sharpening their business ideas, conducting feasibility studies, developing business models and providing coaching and mentoring. For academic staff, the university launched its business and enterprise development policy in December 2020 to provide support for staff with business ideas and initiatives. There is also an intellectual property policy that protects the innovations of staff and students. In addition, the university has set up an enterprise (University of Cape Coast Enterprise Limited) to help to commercialize the ideas and research findings of staff.

Ghana Communication Technology University established an entrepreneurship hub at its Business School to promote entrepreneurship development in the university. The university organizes workshops in research and innovation, and supports initiatives by staff that are beneficial to society at large. It has empowered the Business School to set up an entrepreneurship club and a centre for entrepreneurship that is partially sponsored by the Innovation Hub under the Ministry of Communication. Through the centre, the Business School won a grant through the Innovation Hub.

The University of Ghana has a record of community engagement, is responsive to community needs, and is active in undertaking research, addressing community needs and challenges, and providing the community with high-quality skills training. At the start of the coronavirus disease (COVID-19) outbreak in Ghana, the School of Pharmacy embarked on an ambitious entrepreneurial project to produce alcohol-based hand sanitizers for sale. The initial target market was the university community, but with significant support from the university (acting through the College of Health Sciences), the enterprise has been able to expand to supply products to several companies and individuals outside the university. The university provided technical support in the naming and registration of the product (UG Pharmol Sanitizer), provided platforms for the product to be marketed throughout the university community and offered space for stocking the products.

3.2 Organizational capacity, people and incentives

Universities can be constrained by their own organizational structures and approaches, making it more difficult to carry out the types of entrepreneurial activities that support their strategic objectives. In this section, some of the key areas a university may look at if it wishes to minimize the organizational constraints affecting the fulfillment of its entrepreneurial agenda are highlighted. This includes its financial strategy, and its ability to attract and retain the right people and to incentivize entrepreneurial behaviour in individuals (OECD and European Commission, 2012).

Table 3.4
Organizational capacity, people and incentives in the surveyed universities
(Percentage)

	Fully disagree	*Strongly disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly agree*	*Fully agree*
2.1. The university has a sustainable financial strategy in place to support its entrepreneurial agenda.	2.6	12.8	0.0	33.3	33.3	5.1	12.8
2.2. The university's entrepreneurial objectives are supported by a wide variety of internal and external funding sources/investment.	0.0	2.6	15.4	25.6	30.8	23.1	2.6
2.3. The university has diverse mechanisms and channels to bring internal stakeholders (including management, staff and students) across levels and departments together to foster their involvement and relationships in line with its entrepreneurial agenda.	0.0	2.6	10.3	23.1	25.6	25.6	12.8
2.4. The university is open to recruiting practitioners with business/entrepreneurship experience to take up teaching, training and research positions.	2.6	7.7	12.8	15.4	12.8	25.6	23.1
2.5. The university has diverse mechanisms and channels to bring female internal and/or external stakeholders together to foster their involvement and relationships in line with its entrepreneurial agenda.	5.1	2.6	15.4	28.2	15.4	17.9	15.4
2.6. The university dedicates adequate investment to staff development to support its entrepreneurial agenda.	0.0	5.1	15.4	38.5	17.9	12.8	10.3
2.7. There are adequate additional resources (e.g., budget, space and time), and clear rewards for staff who actively support and implement the university's entrepreneurial agenda.	2.6	15.4	23.1	12.8	25.6	12.8	7.7
2.8. The university has adequate entrepreneurial support targeting female staff and external partners.	5.1	10.3	23.1	30.8	12.8	10.3	7.7
2.9. Involvement in entrepreneurial activities is included as a key criterion in the performance appraisals and promotion of staff.	15.4	10.3	20.5	20.5	12.8	7.7	12.8

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
2.10. There is adequate status and recognition given to other stakeholders (including alumni, entrepreneurs, individuals, etc.) who contribute to the university's entrepreneurial agenda.	2.6	2.6	15.4	33.3	12.8	23.1	10.3
2.11. Interdisciplinary units and groups that support and/or undertake entrepreneurial activities are prioritized in the university system (including funding schemes, resource allocation, media coverage, etc.).	2.6	5.1	20.5	23.1	20.5	12.8	15.4

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

The overall survey results showed, in table 3.4, that 33.3 per cent of respondents indicated that financial strategy measures are in place but that only minimal implementation had taken place. Another 33.3 per cent of the respondents agreed that financial strategy measures had been applied with some good degree of success worth mentioning. There is significant engagement and linkage with, and recognition by external stakeholders. Over 85 per cent of responses from the private universities are positive about a sustainable financial strategy being in place to support their entrepreneurial agendas. On the other hand, only about 46.34 per cent of the responses from public universities were positive about the same attribute.

As regards the statement that the university's entrepreneurial objectives are supported by internal and external funding sources, 30.8 per cent of respondents agreed that measures have been applied with some good degree of success, while 23.1 per cent strongly agreed. Only few of the respondents (2.6 per cent) fully agreed that the university's entrepreneurial objectives are supported with internal and external funding sources. More of the respondents agreed (25.6 per cent) or strongly agreed (25.6 per cent) that the university has diverse mechanisms and channels to bring internal stakeholders together across levels and departments to foster their involvement and relationships in line with its entrepreneurial agenda. About 61.5 per cent of respondents agreed (who agree to fully agree) that their university is open to recruiting practitioners with business or entrepreneurship experience to take up teaching, training and research positions.

Almost half of the overall respondents indicated that their university had diverse mechanisms and channels to bring female internal and/or external stakeholders together, and to foster their involvement and relationships in line with its entrepreneurial agenda. These responses varied between agree (15.4 per cent), strongly agree (17.9 per cent) and fully agree (15.4 per cent), as shown in table 3.4. Some respondents (28.2 per cent) indicated that measures were in place to bring female internal and/or external stakeholders together but that only minimal implementation taken place. None of the respondents in the survey fully disagreed that their university invests adequately in staff development to support its entrepreneurial agenda.

The results reveal that there is inadequate entrepreneurial support targeting female staff and external partners, with just a third of the respondents giving positive responses to that statement. In addition, entrepreneurial activities cannot be said to be a key criterion for performance appraisal and promotion of staff. This is evident in the survey results. Figure 3.2 shows a weighted average of all the responses to the 11 statements on organizational capacity, people and incentives, revealing the comparison of views at the university level.

Figure 3.2
Weighted average response to statements relating to organizational capacity, people and incentives
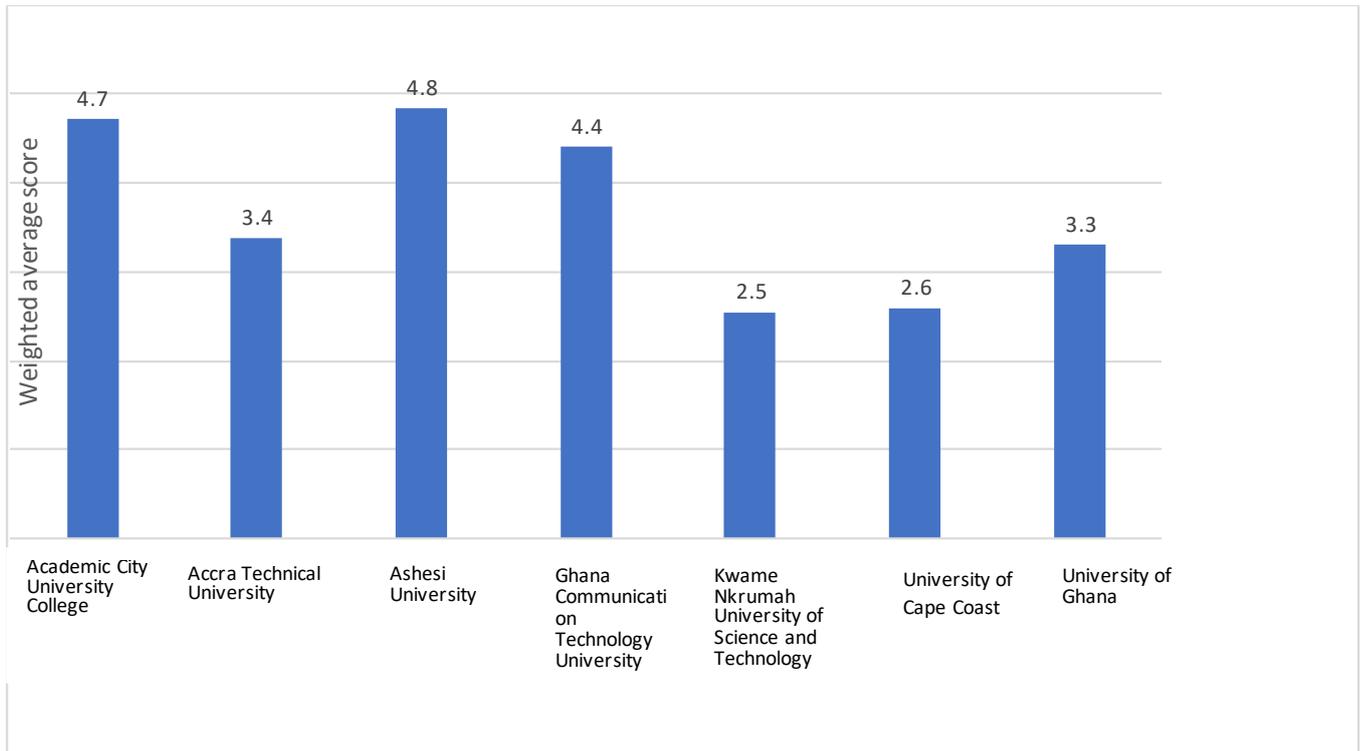
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3.3 Entrepreneurship development in teaching and learning

The survey results in table 3.5 show that two thirds of the respondents agreed (agree, strongly agree and fully agree) with the following statements:

- The university structure strongly stimulates developmental support tailored towards entrepreneurial mindsets and skills.

- The university explicitly encourages staff in all departments to take an entrepreneurial approach to teaching, learning and research, promote diversity and encourage creativity among students.

- The university actively encourages and invests in learning and teaching innovations in entrepreneurship education.

- The university strongly encourages and supports staff in creating new curricula related to entrepreneurship.

- The university actively develops pedagogies that focus on hands-on entrepreneurial activities and experiential/practice-based learning.

- The university is actively engaging external stakeholders, including graduate entrepreneurs and business practitioners in teaching, learning and research activities.

- The university actively encourages and invests in learning and teaching innovations (including technologies, techniques, media, etc.) in entrepreneurship education.

- Entrepreneurship curricula are regularly refreshed to incorporate new entrepreneurial/business knowledge, needs and trends.

Table 3.5
Entrepreneurship development in teaching and learning in surveyed universities
(Percentage)

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
3.1. The university is structured in such a way that strongly stimulates and supports the development of entrepreneurial mindsets and skills across the institution.	0.0	10.3	15.4	12.8	23.1	7.7	30.8
3.2. Entrepreneurial training and development for staff takes place in ALL parts of the university.	7.7	7.7	17.9	28.2	15.4	10.3	12.8
3.3. The university explicitly encourages staff in all departments to take an entrepreneurial approach to teaching, learning and research, promote diversity and encourage creativity and innovation among students.	0.0	7.7	7.7	23.1	28.2	10.3	23.1
3.4. The university strongly encourages and supports staff in creating new curricula related to entrepreneurship.	0.0	7.7	0.0	20.5	30.8	28.2	12.8
3.5. The entrepreneurial behaviour of staff and students is strongly supported throughout the university experience, from creating awareness and stimulating ideas to development and implementation (pre-business and business start-up).	0.0	5.1	12.8	33.3	25.6	7.7	15.4
3.6. The university actively engages external stakeholders, including graduate entrepreneurs and business practitioners, in teaching, learning and research activities.	0.0	5.1	10.3	20.5	28.2	17.9	17.9
3.7. The university actively encourages and invests in learning and teaching innovations (including technologies, techniques, medium, etc.) in entrepreneurship education.	5.1	2.6	15.4	12.8	30.8	15.4	17.9
3.8. The university actively develops pedagogies that are focused on hands-on entrepreneurial activities and experiential/practice-based learning.	2.6	7.7	5.1	17.9	28.2	15.4	23.1
3.9. The university actively delivers upskill/reskill entrepreneurship training for business and workforce in the community.	2.6	2.6	15.4	28.2	25.6	17.9	7.7
3.10. Entrepreneurship curricula are regularly refreshed to incorporate new entrepreneurial/business knowledge, needs and trends.	2.6	2.6	12.8	20.5	28.2	15.4	17.9

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Less than 50 per cent of the sample interviewed agreed (agree, strongly agree and fully agree) that the entrepreneurial behaviour of staff and students is strongly supported throughout the university experience, from creating awareness and stimulating ideas to development and implementation (pre-business and business start-up). Just a third of the sample interviewed agreed (agree, strongly agree and fully agree) that entrepreneurial training and development for staff takes place in all parts of the universities.

Figure 3.3 shows the university level comparison in terms of the overall scoring of the statements on entrepreneurial development in teaching and learning. Academic City University College and Ashesi University had a mean score above 5, implying that measures are applied widely, for example, across the university and with external linkages, yielding good results.

Figure 3.3
Weighted average response to statements relating to entrepreneurship development in teaching and learning
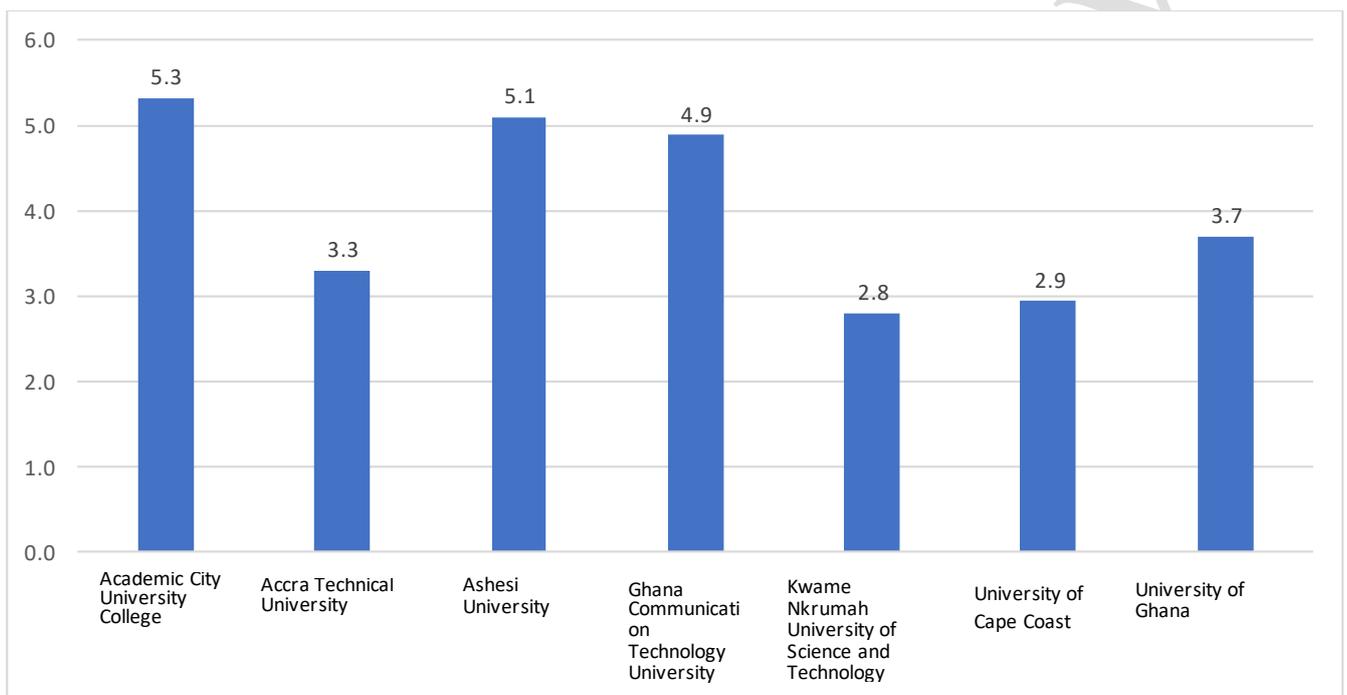
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3.4   Entrepreneurial pathways

Entrepreneurial universities are focused on the process of transforming the business concepts or ideas of their students and staff into practical business enterprises and companies that eventually create employment opportunities. The entrepreneurial pathways are not just limited to the internal processes and management of the universities, but rather take a more pluralistic approach to providing access to both internal and external opportunities and expertise, as shown in the statements listed in table 3.6.

Table 3.6
Entrepreneurial pathways of universities surveyed in Ghana
(Percentage)

	Fully disagree	*Strongly disagree*	*Disagree*	*Neutral*	*Agree*	*Strongly agree*	*Fully agree*
4.1. The university actively raises awareness of the value and impact of developing entrepreneurial mindsets and skills among its staff and students, and encourages them to become entrepreneurial.	0.0	5.1	7.7	20.5	23.1	25.6	17.9
4.2. The university has adequate entrepreneurial support targeting female students.	5.1	5.1	15.4	33.3	20.5	10.3	10.3
4.3. The university provides adequate opportunities for its staff and students to experience and/or practice entrepreneurship.	0.0	5.1	10.3	33.3	23.1	20.5	7.7
4.4. The university provides adequate support for its staff and students to turn entrepreneurial ideas into action.	0.0	5.1	10.3	30.8	28.2	15.4	10.3
4.5. The university provides dedicated mentoring by entrepreneurs/business practitioners for its staff and students in entrepreneurial activities.	2.6	2.6	10.3	25.6	33.3	5.1	20.5
4.6. The university actively facilitates needed access to private financing/investment for potential staff and students to turn entrepreneurial ideas into action.	0.0	12.8	15.4	28.2	23.1	12.8	7.7
4.7. The university provides needed access to business incubation facilities for its staff and students.	0.0	0.0	10.3	15.4	23.1	33.3	17.9
4.8. The university has dedicated resources and programmes for creating student start-ups and/or academic spin-offs.	0.0	5.1	17.9	25.6	23.1	20.5	7.7
4.9. The university has clear systems to help its staff and students to protect their innovations and other intellectual properties.	0.0	2.6	15.4	20.5	35.9	10.3	15.4
4.10. The university has clear systems to enable its staff and students to commercialize innovations.	0.0	2.6	23.1	20.5	23.1	15.4	15.4

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

The responses to statements on entrepreneurial pathways are presented in table 3.6. The survey results show that about 66.6 per cent of the respondents agreed (23.1 per cent agree, 25.6 per cent strongly agree and 17.9 per cent fully agree) that the university actively raises awareness of the value and impact of developing entrepreneurial mindsets and skills among its staff and students, and encourages them to become entrepreneurial. A little over 50 per cent agreed (20.5 per cent agree, 10.3 per cent strongly agree and 20.3 per cent fully agree) that the university has adequate entrepreneurial support targeting female students. A similar response, of a little over 50 per cent agreement, was observed for the statement that the university provides adequate opportunities for its staff and students

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to experience and/or practice entrepreneurship (23.1 per cent agree, 20.5 per cent strongly agree and 7.7 per cent fully agree).

Half of the sample interviewed agreed that their university provides adequate support for its staff and students to turn their entrepreneurial ideas into action. The responses on mentorship were encouraging, with 78.9 per cent agreeing with the statement that the university provides dedicated mentoring by entrepreneurs/business practitioners for its staff and students in entrepreneurial activities. However, efforts to facilitate access to private financing was low, with only 43.6 per cent agreeing (23.1 per cent agree, 12.8 per cent strongly agree and 7.7 per cent fully agree) that the university actively facilitates the necessary access to private financing/investment for potential staff and students to turn their entrepreneurial ideas into action.

Other statements related to entrepreneurial pathways attracted above average levels of agreement. There was an overwhelmingly positive response (74.1 per cent) to the statement that the university provides the necessary access to business incubation facilities for its staff and students, while 61.6 per cent of the respondents agreed that their university has clear systems to help its staff and students to protect their innovations and other intellectual properties. Overall, 51.3 per cent agreed that their university has dedicated resources and programmes for creating student start-ups and/or academic spin-offs, while 53.9 per cent of respondents agreed that their university has clear systems to enable its staff and students to commercialize innovations.

Figure 3.4
Weighted average response to statements relating to pathways for entrepreneurs
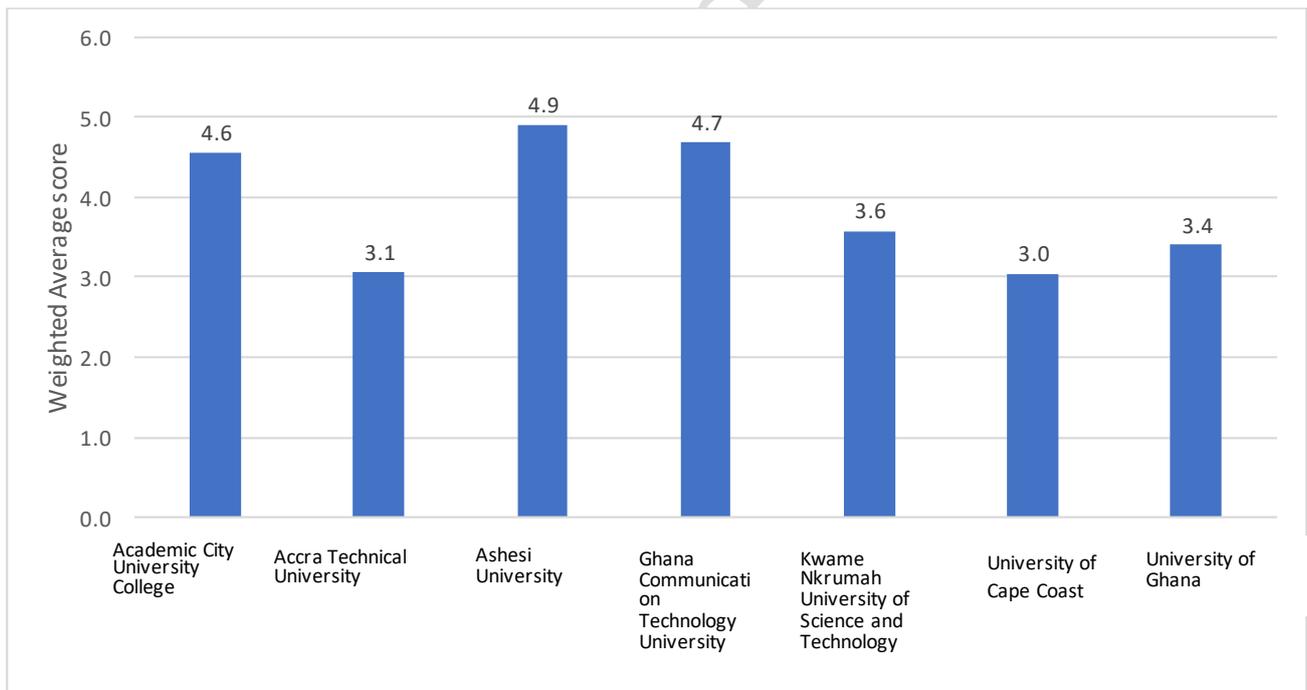
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Concluding remarks

The pathway for entrepreneurs depicts a well above average level of awareness-raising of the value and impact of developing entrepreneurial mindsets and skills among staff and students, but gender concerns were not adequately captured in the entrepreneurial pathways. However, the rate of universities facilitating access to private financing by potential entrepreneurs was low.

3.5 University-business/external relationships for knowledge exchange

The active involvement of a range of stakeholders contributes to creating value for the university and for society. Building and sustaining relationships with key partners and collaborators (e.g., public sector, regions, businesses, alumni, professional bodies) is essential to achieving a university's full potential in entrepreneurship, research, teaching and other activities related to their third mission. The respondents of the entrepreneurial universities survey were asked to express their level of agreement with statements relating to university-business/external relationships for knowledge exchange, as presented in table 3.7.

Table 3.7
University-business/external relationships for knowledge exchange
(Percentage)

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
5.1. The university is strongly committed to building local knowledge exchanges and collaborative partnerships with industry, society and the public sector.	0.0	0.0	5.1	15.4	23.1	25.6	30.8
5.2. The university is strongly committed to building international knowledge exchanges and collaborative partnerships with industry, society and the public sector.	0.0	0.0	10.3	5.1	25.6	25.6	33.3
5.3. The university has strong links and partnerships with external incubators, science parks and similar platforms.	0.0	2.6	10.3	25.6	15.4	28.2	17.9
5.4. The university has dedicated channels and schemes to attract prospective partners in industry, society and the public sector to collaborate with its staff and students.	0.0	2.6	7.7	20.5	28.2	33.3	7.7
5.5. The university is open to providing access to its facilities and services for external stakeholders to undertake entrepreneurial activities.	0.0	7.7	2.6	15.4	28.2	28.2	17.9
5.6. The university has a clear system through which external stakeholders could exploit the university's intellectual properties (e.g., licences, patents, technologies) in entrepreneurial activities.	0.0	5.1	12.8	20.5	25.6	23.1	12.8
5.7. The university has strong links with industry to provide short-term placements, internships and industry project opportunities for its students.	0.0	0.0	2.6	10.3	38.5	20.5	28.2
5.8. The university plays a key role in informing or advising the entrepreneurship and enterprise-related public policy of the community.	0.0	2.6	10.3	12.8	38.5	25.6	10.3
5.9. The university is active in undertaking contract research commissioned by private and public sector actors.	2.6	0.0	7.7	12.8	28.2	33.3	15.4
5.10. The university regularly holds public lectures and events that bring together academic, industry and public sectors for knowledge exchange about local and/or global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance.	0.0	0.0	7.7	17.9	25.6	35.9	12.8

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

A significant proportion (79.5 per cent) of the sample interviewed agreed (23.1 per cent agree, 25.6 per cent strongly agree and 30.8 per cent fully agree) that their university is strongly committed to building local knowledge exchanges and collaborative partnerships with industry, society and the public sector. Well over 80 per cent of the sample interviewed agreed (25.6 per cent agree, 25.6 per cent strongly agree and 33.3 per cent fully agree) that their university is strongly committed to building international knowledge exchanges and collaborative partnerships with industry, society and the public sector. About 61.5 per cent of the respondents agreed (15.4 per cent agree, 28.2 per cent strongly agree and 17.9 per cent fully agree) that their university has strong links and partnerships with external incubators, science parks and similar platforms. Regarding the statement that the

university has dedicated channels and schemes to attract prospective partners in industry, society and the public sector to collaborate with its staff and students, 28.2 per cent, 33.3 per cent, and 7.7 per cent of the sample interviewed agreed, strongly agreed and fully agreed, respectively.

Overall, the universities surveyed are open to providing access to their facilities and services for external stakeholders to undertake entrepreneurial activities, as expressed by 74.3 per cent of the sample interviewed. About 61.5 per cent of the sample interviewed agreed that their university has a clear system through which external stakeholders could exploit the university's intellectual properties (e.g., licences, patents, technologies) in entrepreneurial activities. The universities surveyed have strong links with industry to provide short-term placements, internships and industry project opportunities for their students, as indicated by 87.2 per cent of the sample interviewed. About 74.4 per cent of the sample interviewed agreed that their university plays a key role in informing or advising the entrepreneurship and enterprise-related public policy of the community, while 76.9 per cent of the respondents agreed that their university is active in undertaking contract research commissioned by private and public sector actors.

Well over 70 per cent of the respondents agreed that their university regularly holds public lectures and events that bring together academia, industry and public sectors to exchange knowledge about local and/or global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance, and that their university works closely with professional institutions to ensure or certify the professional quality and standards of its programmes and graduates.

Figure 3.5
Weighted average response to statements relating to university-business and external relationships for knowledge exchange
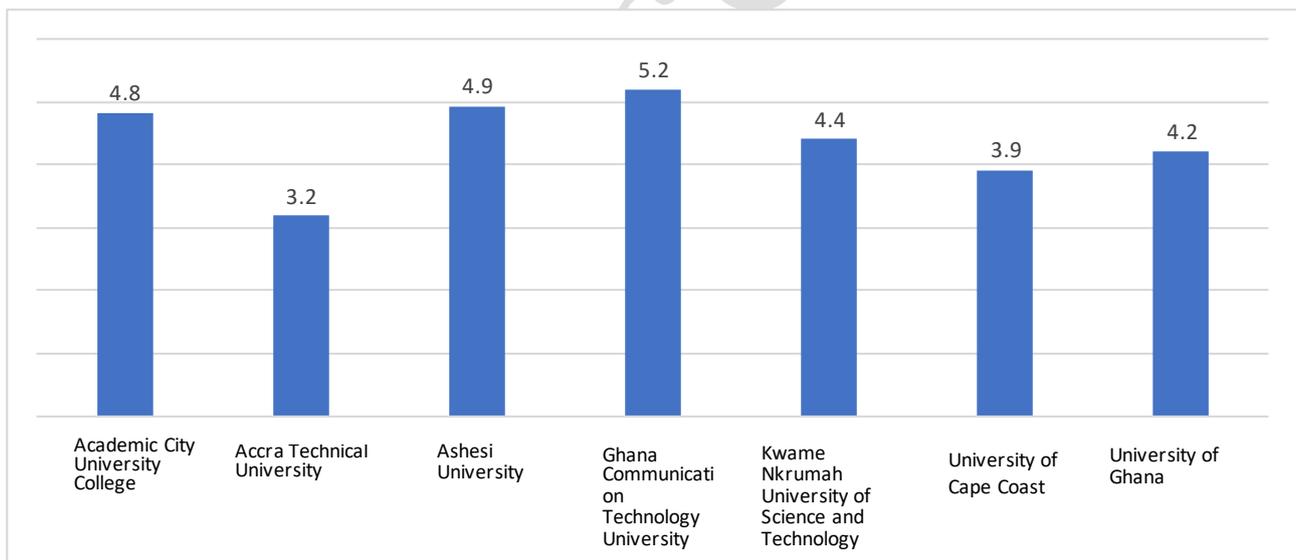
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3.6 The entrepreneurial university as an international institution

A significant proportion (79.5 per cent) of the respondents agreed that internationalization is a key part of their university's entrepreneurial strategy and that their university explicitly encourages and supports the international mobility (e.g., exchanges, volunteering, secondment, fellowships) of its staff and students (including PhD students). About 72 per cent of the respondents agreed that the university actively attracts and recruits international staff, visiting fellows and delegations (including

teaching, research and PhDs). An overwhelming majority (87.2 per cent) agreed that their university actively seeks to raise its international profile and ranking, while 76.9 per cent agreed that their university clearly incorporates the objective of internationalization in its learning and teaching strategies, as shown in table 3.8.

Regarding the statement that the university explicitly encourages and supports education and research initiatives that address global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance, 20.5 per cent of the respondents agreed, 28.2 per cent strongly agreed and 33.3 per cent fully agreed. Again, over 80 per cent of respondents agreed that their university actively seeks to establish new and/or deepen existing education and research international partnerships, while 69.2 per cent agreed that their university actively promotes and showcases its international activities and achievements through diverse channels.

Table 3.8
The entrepreneurial university as an international institution
(Percentage)

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
6.1. Internationalization is a key part of the university's entrepreneurial strategy.	0.0	0.0	5.1	15.4	23.1	17.9	38.5
6.2. The university explicitly encourages and supports the international mobility (e.g., exchanges, volunteering, secondment, fellowships) of its staff and students (including PhD students).	0.0	0.0	10.3	10.3	15.4	30.8	33.3
6.3. The university actively attracts and recruits international staff, visiting fellows and delegations (including teaching, research and PhDs).	0.0	2.6	5.1	20.5	20.5	30.8	20.5
6.4. The university actively seeks to raise its international profile and ranking.	0.0	2.6	0.0	10.3	20.5	20.5	46.2
6.5. The university clearly incorporates the objective of internationalization in its learning and teaching strategies.	0.0	2.6	5.1	15.4	23.1	33.3	20.5
6.6. The university explicitly encourages and supports education and research initiatives that address global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance.	0.0	0.0	5.1	7.7	20.5	30.8	35.9
6.7. The university actively seeks to establish new education and research international partnerships and/or deepen existing ones.	0.0	0.0	5.1	12.8	20.5	28.2	33.3
6.8. The university actively promotes and showcases its international activities and achievements through diverse channels.	0.0	2.6	5.1	23.1	15.4	33.3	20.5
6.9. The university actively pursues transnational higher education opportunities (e.g., international branch campuses, distance-learning and/or joint programmes with international partners).	0.0	5.1	10.3	17.9	15.4	28.2	23.1
6.10. The university and its departments and faculties actively participate in international education and research networks.	0.0	0.0	2.6	12.8	17.9	41.0	25.6

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Regarding the statement that the university actively pursues transnational higher education opportunities (e.g., international branch campuses; distance learning and/or joint programmes with

international partners), 15.4 per cent of the respondents agreed, 28.2 per cent strongly agreed and 23.1 per cent fully agreed. About 84 per cent of the sample interviewed agreed that the university and its departments and faculties actively participate in international education and research networks.

Table 3.9
Internationalization and networking initiatives by selected universities

University	Internationalization and networking efforts
Academic City University College	The university has taken steps to partner with international universities, one of which is Worcester Polytechnic Institute. In addition, one student had the opportunity to do her internship in South Africa. In lieu of strengthening the research capacity of lecturers, the university organized a research-writing seminar for its lecturers, which was moderated by a visiting professor from a university in the United Kingdom. The university has both local and foreign students and lecturers working on projects. They share their experiences and knowledge.
Ashesi University	The university has a clear internationalization agenda and executes this through the Provost Office, and the Office of Diversity and International Programmes. There are various exchange collaborations with partner universities to send undergraduate students on study-abroad programmes. There are various teaching fellowships in place to allow faculty from partner universities to teach at Ashesi for an agreed period. During this online period, online study-abroad opportunities have emerged for students so that they do not need to relocate in order to join study-abroad classes. Exchange programmes with a number of universities in Canada, France, Sweden, the United States and other countries are in place. The university participates in the global Map the System challenge and various education networks, such as the Open Society University Network. The admissions process consciously recruits students from across the continent. Over 20 African countries are represented in the student body and participate in international programmes, such as the Transforming Higher Education Project.
Ghana Communication Technology University	There is strong collaboration with other institutions and partnerships for transnational education, such as with Coventry University (United Kingdom), Arlborg University (Denmark), Anhalt University (Germany), Jiangsu University (China) and CASS European Institute of Management Studies (France), that helps to create international exchanges. The university supports staff in their travel for international conferences and workshops and also invites external researchers and other resource persons to share their experiences and knowledge with the university. The university has many transnational programmes and is looking to run more programmes with international communities and universities.
Kwame Nkrumah University of Science and Technology	Many colleges encourage departments to invite or employ adjunct professors from the international community to enhance their profile. It is also a key parameter in the university's annual Quality Assurance and Planning Unit assessment of departments. Many staff members and students have benefited (and continue to benefit from mobility programmes in the many international collaborative projects. Examples are the Building Stronger University Projects with the Danish International Development Agency, the Enhancing Entrepreneurship Innovation and Sustainability in Higher Education project with the European Union and the West African Science Service Centre for Climate Change and Adapted Land Use. In addition, the establishment of the climate science programme at the Department of Physics and the Energy Centre at the College of Engineering are some of the success stories of the university's proactive measures towards using education and research to address global challenges and needs. Activities and initiatives are largely decentralized with faculties, schools and departments usually spearheading the initiatives. There are many ongoing success stories. For example, the Departments of Environmental Science and Food Science and Technology of the College of Science, have joint programmes with Isa Lille, France. The university has a policy on study leave, sabbatical leave, staff and student exchange programmes, and several collaborations that give staff the opportunity to increase their international exposure. The establishment of the International Programmes Office, with the mandate to coordinate all international programmes, and student and research collaborations between the university and its international partners, is fundamental evidence of the university's desire to internationalize.
University of Cape Coast	The university has a number of collaborations with various international institutions, such as the European Union and the World Bank. There are some internationalization-related opportunities for staff but these opportunities are limited, for example, PhD students can complete their course with very limited international exposure to present at conferences. The university is currently partnering with four other African universities to undertake the Academy Mobility Programme and it is involved with intra-African student exchange programmes. The university is actively engaged in international research activities and networks as part of its visibility agenda. It collaborates with several universities globally to conduct research and disseminate the key findings. There are a number of joint international courses and degrees run, for instance, by the School of Business and the Centre for Fisheries and Coastal Management of the

University	Internationalization and networking efforts
	university. Individual faculty members also engage in joint international research projects and some entrepreneurship projects.
University of Ghana	The university has established links with universities in Europe and North America. It is a member of the following associations: - International Association of Universities - Association of Commonwealth Universities - Association of African Universities - League of World Universities - Norwegian Universities' Committee for Development Research and Education - Council for International Educational Exchange - International student exchange programmes - Commonwealth Universities Student Exchange Consortium
Accra Technical University	The Directorate of International Programmes and Institutional Cooperation was formed to promote, support and coordinate all matters relating to international education activities in the university. These activities include international student and staff exchanges, research collaborations and publications, and information-sharing, all of which is aimed at enhancing the international image of the university. The Directorate has promoted links with higher education institutions from China, the Netherlands, Nigeria and the United States, among others. - Vaasan Ammattikorkeakoulu – University of Applied Sciences, Finland - University of Maryland Eastern Shore, United States - Partnership for Applied Science - The Hague University of Applied Arts and Sciences - Malta College of Arts, Science and Technology - Tianjin Economics and Trade School, China

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Figure 3.6
Weighted average response to statements relating to entrepreneurial universities as international institutions
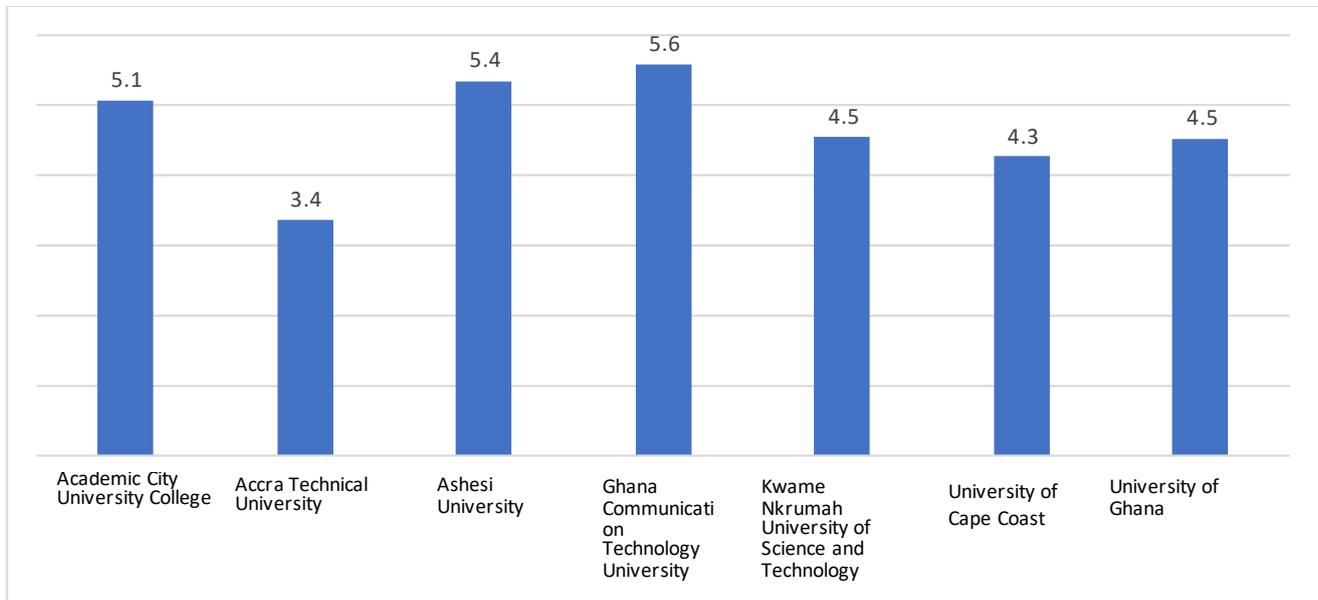
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3.7   Measuring the impact of the entrepreneurial university

This section is focused on measuring the impact of entrepreneurial universities, in particular at the local level. The impact indicators considered relate to graduate entrepreneurship, talent retention and local economic development, as well as reviewing the outcomes and impacts of the broader entrepreneurial strategy of the university.

Overall, the respondents scored most of the impact statements below average. Approximately 44 per cent of respondents agreed that their university has put in place clear guidelines and systems to record, measure and review the outcomes of its entrepreneurial strategy on a regular basis, while 35.9 per cent of respondents agreed that their university regularly assesses the impact of its entrepreneurial strategy on the entrepreneurship development of staff and students across the institution. About half of respondents agreed that their university regularly assesses the level of engagement of all faculties and departments in entrepreneurship teaching, research and entrepreneurial activities across the institution.

Fewer than half (48.9 per cent) of respondents agreed with the statement that their university regularly assesses the impact of entrepreneurship teaching and learning on participants' entrepreneurial orientation and skills development (e.g., changes in participants' motivation to undertake entrepreneurial activities, the level of competence in the skills gained)

Again, 43.7 per cent of respondents agreed (23.1 per cent agree, 10.3 per cent strongly agree and 10.3 per cent fully agree) that their university regularly assesses the impact of its entrepreneurship research on producing knowledge of use to policy, business practices, scholarly activity and social life. A similar score was observed in respect of the statement that the university carries out regular monitoring and evaluation of the outcomes of its knowledge exchange activities with external stakeholders (e.g., in terms of start-ups and spin-offs, patents, new research ideas, new partnerships).

About 35.9 per cent of respondents agreed that their university carries out regular monitoring and evaluation of the impact of its start-up and enterprise support (e.g., number of users, user satisfaction, new

support introduced, number of start-up ideas realized, number of new ventures). Only 30.8 per cent of the sample interviewed agreed with the statement that the university regularly measures and reviews the impact of its entrepreneurial initiatives and programmes on the economic development of the community and the region.

Regarding the statement that the university regularly publishes and shares the results of assessments the impact of its entrepreneurial activities and outputs with internal and external stakeholders, only 30.8 per cent of the sample interviewed agreed (12.8 per cent agree, 15.4 per cent strongly agree and 2.6 per cent fully agree). About 35.9 per cent of respondents agreed that their university engages both internal and external stakeholders in reviewing its entrepreneurial agenda and the outcomes (see table 3.10).

Table 3.10
Measuring the impact of the entrepreneurial university
(Percentage)

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
7.1. The university has put in place clear guidelines and systems to record, measure and review the outcomes of its entrepreneurial strategy on a regular basis.	0.0	7.7	12.8	35.9	23.1	10.3	10.3
7.2. The university regularly assesses the impact of its entrepreneurial strategy on the entrepreneurship development of staff and students across the institution.	0.0	7.7	17.9	38.5	15.4	5.1	15.4
7.3. The university regularly assesses the level of engagement of all faculties and departments in entrepreneurship teaching, research and entrepreneurial activities across the institution.	0.0	7.7	20.5	20.5	23.1	20.5	7.7
7.4. The university regularly assesses the impact of entrepreneurship teaching and learning on participants' entrepreneurial orientation and skills development (e.g., changes in participants' motivation to undertake entrepreneurial activities, the level of competence in the skills gained)	0.0	10.3	20.5	20.5	28.2	10.3	10.3
7.5. The university regularly assesses the impact of its entrepreneurship research on producing knowledge of use to policy, business practice, scholarly activity and social life.	0.0	7.7	20.5	28.2	23.1	10.3	10.3
7.6. The university carries out regular monitoring and evaluation of the outcomes of its knowledge exchange activities with external stakeholders (e.g., in terms of start-ups and spin-offs, patents, new research ideas, new partnerships).	0.0	5.1	17.9	33.3	25.6	12.8	5.1
7.7. The university carries out regular monitoring and evaluation of the impact of its start-up and enterprise support (e.g., number of users, satisfaction of users, new support introduced, number of start-up ideas realized, number of new ventures).	0.0	7.7	23.1	33.3	20.5	7.7	7.7
7.8. The university regularly measures and reviews the impact of its entrepreneurial initiatives and programmes on the economic development of the community and the region.	0.0	7.7	23.1	38.5	15.4	7.7	7.7
7.9. The university regularly publishes and shares assessments results of the impact of its entrepreneurial activities and outputs on internal and external stakeholders.	0.0	10.3	23.1	35.9	12.8	15.4	2.6

	Fully disagree	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Fully agree
7.10. The university engages both internal and external stakeholders in reviewing its entrepreneurial agenda and the outcomes.	0.0	7.7	23.1	33.3	12.8	12.8	10.3

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Figure 3.7
Weighted average response to statements relating to measuring the impact of entrepreneurial universities
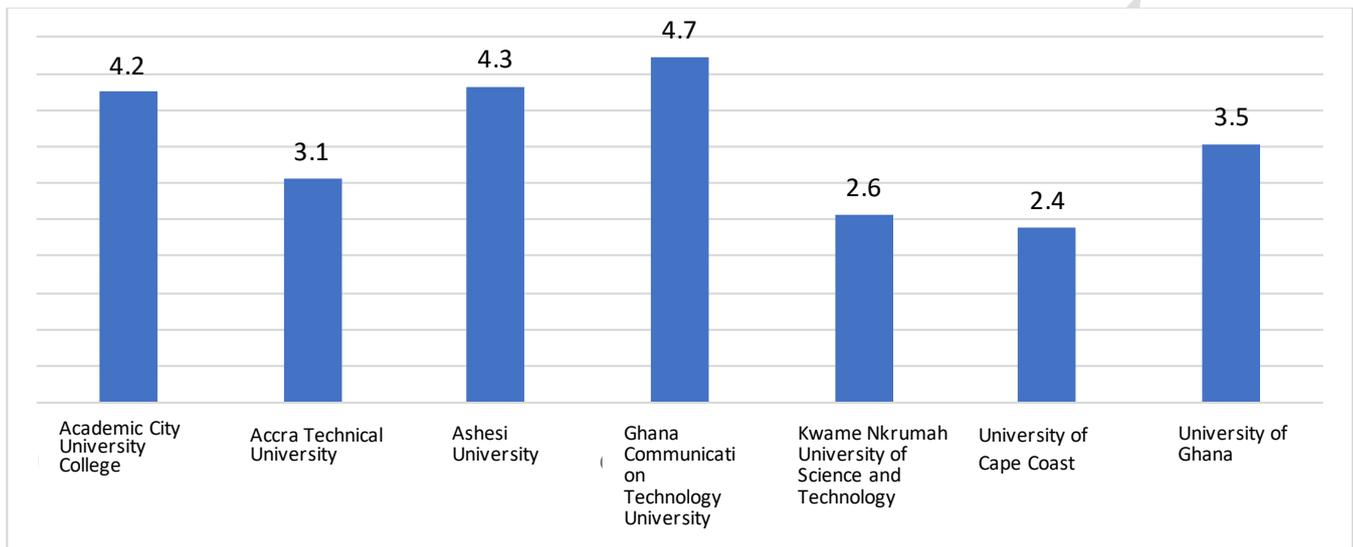
Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3.8 Mechanisms, entrepreneurship support structure, services and programmes, and financing

The aim of this section is to investigate the extent to which governance structures support entrepreneurial training, services and programmes, as well as budget allocations for entrepreneurial programmes and activities.

3.8.1 Mechanisms and governance structures for entrepreneurship

In general, the inclusion of entrepreneurial learning and teaching in the university mission and strategy is very high among the universities surveyed. At Kwame Nkrumah University of Science and Technology, a rate of 80 per cent agreement was recorded with the statement that entrepreneurial learning and teaching was included in the university mission, whereas the University of Ghana, Ghana Communication Technology University, Ashesi University and Academic City University College recorded 100 per cent rates of agreement with that statement. On the other hand, the University of Cape Coast had a greater percentage of respondents who felt that there was no such inclusion of entrepreneurial learning and teaching. Entrepreneurial learning and teaching is fully included in the university mission and strategy of Academic City University College, Ashesi University, Ghana Communication Technology University and the University of Ghana. Accra Technical University and Kwame Nkrumah University of Science and Technology, meanwhile, have rates of 80 per cent certainty as to the inclusion of entrepreneurial learning and teaching in their mission and strategy, as shown in figure 3.3.

Overall, close to 60 per cent of the respondents agreed with the assertion that research on entrepreneurship is explicitly included in the university mission and strategy, as shown in figure 3.7. When the data were disaggregated by university, the results showed that Ghana Communication Technology University has a rate of 100 per cent commitment to research in entrepreneurship, intellectual property, knowledge exchange and partnership as these are included in the university's mission and strategy. However, the commercialization of research outputs and innovations was given less consideration, with a score of 60 per cent. Accra Technical University revealed the lowest rate of inclusion of research in entrepreneurship, intellectual property, knowledge exchange and partnership, commercialization of research outputs and innovation and technology outputs in their mission and strategy of the seven universities, with technology outputs receiving the least attention in their mission and strategy.

The inclusion of intellectual property was highest at Ghana Communication Technology University (100 per cent), followed by Kwame Nkrumah University of Science and Technology (80 per cent), and was lowest at Ashesi University. In general, there was a high rate of inclusion of entrepreneurial learning and teaching across the seven universities and less consideration of the commercialization of research outputs and innovations in the missions and strategies of the universities.

In terms of business start-ups and academic spin-offs, the rate of inclusion in the university mission and strategy was highest at Ghana Communication Technology University (80 per cent) and absent from the mission and strategy of the University of Ghana. In general, it was the least included in all seven universities. Internalization was strongly included across all seven tertiary institutions, followed by engagement in community, regional or socioeconomic development. While Ashesi University had a higher rate of inclusion of engagement in community, regional or socioeconomic development (100 per cent), Ghana Communication Technology University had a higher rate of inclusion of incubation (100 per cent) in their mission and strategy. In addition, the missions and strategies of the universities had moderate or average rate of inclusion of solutions to global challenges. In the mission and strategy of Accra Technical University, incubation, and business start-ups and academic spin-offs were found to not be included.

3.8.2 Availability of entrepreneurship support structure, services and programmes

As shown in table 3.11, over 70 per cent of the respondents indicated that their universities have available entrepreneurship support structures and programmes in the following areas:

- Specialized units to coordinate individual entrepreneurial activities (e.g., technology transfer offices, knowledge exchange centres, industry liaison units, student enterprise development support units).

- A high-level leadership position (e.g., dean/director/chair of entrepreneurship) assigned to oversee the implementation of its entrepreneurial strategy.

- A designated unit/team to manage intellectual property issues (e.g., patents, non-disclosure agreements, other contractual agreements) relating to the internal knowledge and innovations produced.

- Shared facilities for research and teaching across faculties and/or departments to exploit internal knowledge.

- Programmes/initiatives to bring successful private sector-based innovators and entrepreneurs to become involved in/support teaching and research.

- The university has… [new entrepreneurship-related programmes and courses introduced across the university in the past three years.].

- Student international mobility programmes (e.g., international exchanges, internships and/or volunteering programmes).

- Staff international mobility programmes (e.g., international visiting scholarships, secondment to foreign institutions).

Table 3.11
Overall responses on the availability of entrepreneurship support structures, services and programmes
(Percentage)

Entrepreneurship support structures, services and programmes	*No*	*Not sure*	*Yes*
The university has... [a. member(s) with entrepreneurial/business experience in its board of directors or university council.]	7.7	33.3	59.0
The university has... [b. a central unit/team designated to coordinate entrepreneurial activities across the institution.]	12.8	17.9	69.2
The university has... [c. a high-level leadership position (e.g., dean/director/chair of entrepreneurship) assigned to oversee the implementation of its entrepreneurial strategy.]	15.4	7.7	76.9
The university has... [d. specialized units to coordinate individual entrepreneurial activities (e.g., technology transfer offices, knowledge exchange centres, industry liaison units, student enterprise development support units).]	5.1	10.3	84.6
The university has... [e. a designated unit/team (e.g., alumni office and/or international office) to liaison and manage external relationships with international partners and associates.]	5.1	15.4	79.5
The university has... [f. a designated unit/team to manage intellectual property issues (e.g., patents, non-disclosure agreements, other contractual agreements) for the internal knowledge and innovations produced.]	7.7	17.9	74.4
The university has... [g. a central quality assurance unit/team to review the quality of entrepreneurial activities of the university.]	17.9	12.8	69.2
The university has... [h. shared facilities for research and teaching across faculties and/or departments for exploiting internal knowledge.]	10.3	17.9	71.8
The university has... [i. programmes/initiatives to bring successful private sector based innovators and entrepreneurs to become involved in/support teaching and research.]	10.3	15.4	74.4
The university has... [j. specific initiatives that promote and support female staff and students in undertaking entrepreneurial activities.]	17.9	41.0	41.0
The university has... [k. seasoned and respected business leader(s) to serve as entrepreneurs-in-residence.]	30.8	23.1	46.2
The university has... [l. extra curricular and/or non-credit-bearing activities and events on entrepreneurship topics delivered by entrepreneurs and business practitioners.]	20.5	12.8	66.7
The university has... [m. staff development programmes focusing on entrepreneurial skills, knowledge and techniques for learning and teaching.]	35.9	10.3	53.8

Entrepreneurship support structures, services and programmes	*No*	*Not sure*	*Yes*
The university has... [n. incentive programmes in place to recognize and/or award (e.g., cash prizes, awards, certificates, paid study and development leave) successful entrepreneurial initiatives by staff and students.]	30.8	28.2	41.0
The university has… [o. recognition and awards for outstanding external stakeholders, partners and/or alumni who actively engage in and/or contribute to entrepreneurship promotion.]	25.6	38.5	35.9
The university has... [p. a consultation panel of external stakeholders (e.g., entrepreneurs, industry experts) to review its entrepreneurship-related programmes and projects.]	17.9	35.9	46.2
The university has... [q. new entrepreneurship-related programmes and courses introduced across the university in the last three years.]	5.1	15.4	79.5
The university has... [r. student international mobility programmes (e.g., international exchanges, internships and/or volunteering programmes).]	5.1	7.7	87.2
The university has… [s. staff international mobility programmes (e.g., international visiting scholarships, secondments to foreign institutions)]	12.8	15.4	71.8
The university has... [t. joint degrees and/or research programmes with international partners.]	12.8	23.1	64.1
The university has... [u. joint research centres with international partners.]	20.5	15.4	64.1
The university has... [v. designated channels (e.g., agents, offices) to recruit international staff and students.]	10.3	20.5	69.2
The university has... [w. designated public channels (e.g., printed or online) to disseminate entrepreneurship-related information (e.g., events, outputs, impacts) about the university.]	10.3	30.8	59.0

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Fewer than 50 per cent of the respondents indicated that the universities have available entrepreneurship support structures and programmes in the following areas:

- Incentive programmes in place to recognize and/or award (e.g., cash prizes, awards, certificates, paid study and development leave) successful entrepreneurial initiatives by staff and students.

- Recognition and awards for outstanding external stakeholders, partners and/or alumni who actively engage in and/or contribute to entrepreneurship promotion.

- Specific initiatives that promote and support female staff and students in undertaking entrepreneurial activities.

- Seasoned and respected business leader(s) to serve as entrepreneurs-in-residence.

- A consultation panel of external stakeholders (e.g., entrepreneurs, industry experts) to review its entrepreneurship-related programmes and projects.

3.9 Budgeting and financing

3.9.1 Budget allocations

Information on budgeting and financing was limited, with just a third of respondents indicating an increase in the budgetary allocation for entrepreneurial activities. The overall responses showed that there had been improvement in the proportion of university budget allocated to entrepreneurial activities over the previous three years. About 23.1 per cent of respondents indicated that there had been an improvement in university budget allocation for direct entrepreneurial activities,

while 35.9 per cent answered in the affirmative regarding an increase in budgetary allocation for entrepreneurial support facilities and services over the past three years. Budgetary allocations for internationalization activities, knowledge exchange and engagement activities with external parties over the same period had increased, as reported by 43.6 per cent and 38.5 per cent of respondents respectively. The budgetary allocation for entrepreneurial skills training and development had improved over the reporting period, as indicated by a third of the respondents (see table 3.12).

Table 3.12
Proportion of the university budget allocated to specific activities
(Percentage)

	No information/ Not sure	No separate budget allocated	No, it has not grown	Yes, it has grown
(Direct) entrepreneurial activities	41.0	28.2	7.7	23.1
Entrepreneurship programmes	20.5	30.8	12.8	35.9
Entrepreneurial support facilities and services	25.6	23.1	15.4	35.9
Internationalization activities	28.2	12.8	15.4	43.6
Knowledge exchange and engagement activities with external parties	35.9	15.4	10.3	38.5
Entrepreneurial skills training and development of staff	33.3	20.5	12.8	33.3

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

3.9.2 Funding for implementing the entrepreneurial strategy of the university

A similar trend of responses were observed in terms of the growth in funding for implementing the entrepreneurial strategy of the universities. Overall. 23.1 per cent of respondents indicated that the reinvestment of entrepreneurial incomes of the university had grown, as shown in table 3.13. About 28.2 per cent of respondents indicated that domestic public funding had grown, while 23.1 per cent indicated that domestic private funding had grown. In terms of foreign public and private funding for implementing the entrepreneurial strategy, about 28.2 per cent of respondents indicated growth in the past three years. Only 15.4 per cent of respondents indicated that funding from alumni and donations had grown over the past three years, while 23.1 per cent of respondents had responded positively to growth in funding from charities or trust funding over the past three years.

Table 3.13
Funding for implementation of the entrepreneurial strategy of the university
(Percentage)

	No funding from this source at all	No information/not sure	No, it has not grown	Yes, it has grown
a. Reinvestment of entrepreneurial incomes of the university	7.7	64.1	5.1	23.1
b. Domestic public funding	7.7	59.0	5.1	28.2
c. Domestic private funding	2.6	66.7	7.7	23.1
d. Foreign public funding	5.1	59.0	7.7	28.2
e. Foreign private funding	5.1	59.0	7.7	28.2
f. Alumni funding/donations	2.6	69.2	12.8	15.4
g. Charity/trust funding	2.6	66.7	7.7	23.1

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

Table 3.14
Additional comments on begetting and financing

University	Comments
Ashesi University	Facilities, such as those from the Mastercard Foundation and the Ford Foundation, have increased and enabled us to do more in entrepreneurship development. The university has a budget allocation to support entrepreneurial activities and also receives both public and private funding to help with its activities.
Ghana Technology Communication University	Government subventions and funding from the Ghana Education Trust Fund for infrastructure and entrepreneurial drive. The Ministry of Communication, with World Bank funding, supports university initiatives under the Ghana Innovation Hub programme. The university received a grant through the Ghana Innovation Hub (Ihub) programme and feeds the University Entrepreneurship Centre with the fund to organize programmes for lecturers and young entrepreneurs within the school and the wider community.
Kwame Nkrumah University of Science and Technology	Even though the budget for entrepreneurial activities in the university has grown in the past three years, the money has come mainly from external sources. The university does not allocate a budget line for entrepreneurial activities. The university's Centre for Business Development has established an entrepreneurship network of 18 higher education institutes through the African-German Entrepreneurship Academy Project (2017–2020), sponsored by the German Academic Exchange Service (DAAD). Kwame Nkrumah University of Science and Technology, as the lead, was tasked with diffusing its entrepreneurship capabilities to other institutions of higher education in Ghana. Within those three years, Kwame Nkrumah University of Science and Technology worked with Ghana Technology University College, the University of Mines and Technology, the University for Development Studies, Koforidua Technical University, Takoradi Technical University, Ho Technical University, Kumasi Technical University, the University of Education, Winneba, Kumasi Campus, Christian Service University College, Catholic University College, Radford University College and Heritage Christian University College, among others. This training has increased the appetite for entrepreneurship of these sister universities. At the moment, Kwame Nkrumah University of Science and Technology is doing its best to diffuse entrepreneurship practices across the university, instead of making entrepreneurship a preference of those who have the interest. The major challenge remains securing funding and finding qualified and committed staff who show an interest. So far,

University	Comments
	the external funding has been put to good use to the benefit of the university and the community as a whole.
University of Cape Coast	The University of Cape Coast is a publicly funded university and operates on the basis of funding from the central Government. The vision of the current Vice-Chancellor is centred on making the university an entrepreneurial one. The necessary plans and processes are being put in place to achieve the targeted outcomes.

Source: United Nations, ECA, Advancing entrepreneurial universities survey, Ghana, 2021.

4. Conclusions and recommendations

In this chapter, the overall concluding remarks and conclusions drawn from the survey on advancing entrepreneurial universities in Africa, in the case of Ghana, are provided. The recommendations drawn from the survey findings are presented here for further action.

4.1 Conclusions

A total of seven top entrepreneurial universities in Ghana were surveyed: two private universities and five public universities. Investigations into their philosophy, leadership, organizational arrangements, funding and infrastructure, among other factors, reveal that entrepreneurship is clearly integrated as a major part of the university's mission and strategy. Well over 80 per cent of the respondents agreed that there is strong commitment at a high level of the university to implementing the entrepreneurial strategy. The entrepreneurial system, which involves visible leadership, clarity of purpose, the embedding of an entrepreneurial culture, capacity-building and the creation of an enabling environment, is being developed in Ghana. The leadership and organizational structure allow for the faculties, departments and units of the university to explore entrepreneurial opportunities and generate innovative solutions to address societal challenges at the regional, national and community levels. Overall, 61.6 per cent of the respondents attest to the fact that the university structure strongly stimulates developmental support tailored towards entrepreneurial mindsets and skills development.

The entrepreneurial objectives are being supported by a wide variety of internal and external funding sources and investment. Although the proportion of university budget allocated to entrepreneurial activities over the past three years has seen improvement, the rate of growth has been less than 30 per cent in both domestic and foreign funding for entrepreneurial activities at universities. The universities, in particular the private ones, agree that a sustainable financing mechanism is needed to support their entrepreneurial agenda. Fewer than half of respondents agree (25.6 per cent agree, 12.8 per cent strongly agree and 7.7 per cent fully agree) that there are adequate additional resources (e.g., budget, space and time), and clear rewards for staff who actively support and implement the university's entrepreneurial agenda.

Internationalization is critical and well over 80 per cent of the sample interviewed agreed that their university is strongly committed to building international knowledge exchanges and collaborative partnerships with industry, society and the public sector. Gender mainstreaming is an issue of concern, with only a third of the overall respondents agreeing with the statement that the university has adequate entrepreneurial support targeting female staff and external partners.

The survey on advancing entrepreneurial universities in Ghana has generated information and data to inform national and regional processes on the steps needed to support university investments, efforts and time devoted to entrepreneurship. The above findings support the fact that the future of most African economies hinges on the creation and functionality of entrepreneurial universities that have the capacity to train agents who can find solutions to emerging societal challenges. Studies have

also shown a positive and significant relationship between entrepreneurship and economic growth (Preprah and Adekoya, 2020).

The mean descriptive statistics results, using a seven-point Likert scale (from 0 = fully disagree to 6 = fully agree) to indicate the extent of agreement with statements relating to advancing entrepreneurial universities in Ghana, show the following summary responses:

- University leadership and governance support entrepreneurship: mean score of 4.06, implying that measures are applied with some good degree of success

- Organizational capacity, people and incentives support entrepreneurship: mean score of 3.47, implying that measures are in place but that only minimal implementation has taken place

- Entrepreneurship development in teaching and learning: mean score of 3.47, implying that measures are in place but only minimal implementation has taken place

- There are pathways for entrepreneurs: mean score of 4.29 implying that measures are applied with some good degree of success

- University-business/external relationships for knowledge exchange: mean score of 4.29, implying that measures applied with some good degree of success

- Entrepreneurial university as an internationalized institution: mean score of 4.59, implying that measures are applied with some good degree of success

- Measuring the impact of the entrepreneurial university: mean score of 3.32, implying that, overall, measures are in place but only minimal implementation has taken place

4.2 Recommendations

There is increasing recognition that African universities, including universities in Ghana, must have an institutional culture that promotes entrepreneurial careers (Jones and others, 2013, 2018) and produce graduates with entrepreneurial mindsets who can provide innovative solutions to alleviate societal problems. The role of entrepreneurial universities in nation-building has been clearly demonstrated in developed countries, with entrepreneurial universities in the United States and Europe, such as the Massachusetts Institute of Technology, Stanford University and other high-ranking universities having effective policies on patents, technology transfers, the establishment of university-industry partnerships and the creation of new companies (Dalmarco, Hulsink and Blois, 2018).

In general, the policy environment in Ghana is ripe for advancing entrepreneurial universities but there is still room for improvement. There are policy implications from the survey findings. Areas that need immediate attention to develop entrepreneurial universities in Ghana are highlighted here and some recommendations are suggested.

(1) There is a financing and entrepreneurial investment gap. A sustainable financing mechanism to support the entrepreneurial agenda should be discussed at all levels for the socioeconomic development of the African continent. A proposal is made to set up a dedicated fund at the national and the university level to support entrepreneurial programmes and activities. An increase in the budgetary allocation for entrepreneurial skills training and staff development, knowledge exchange and engagement with external parties is recommended.

(2) In general, there was a high rate of inclusion of entrepreneurial learning and teaching across the seven universities and a lower rate of inclusion of the commercialization of

research outputs and innovations in the mission and strategy of the universities. Business start-ups and academic spin-offs were given the least consideration in the university mission and strategy across all universities surveyed. This must be given the attention needed to strengthen the institutional coordination of entrepreneurial universities.

(3) The gender gap needs to be closed through gender mainstreaming in entrepreneurial strategies and objectives, as well as by putting in place adequate entrepreneurial support targeting female students, staff and external partners.

(4) Monitoring and evaluation is a challenge that need to be resolved. Universities need to institutionalize their monitoring and evaluation plans, put in place mechanisms and regularly measure the impact of entrepreneurial programmes and activities. The universities should put in place clear guidelines and systems to record, measure and review the outcomes of their entrepreneurial strategy on a regular basis.

(5) Promote the institutionalization of incentive programmes and award schemes to recognize successful entrepreneurial initiatives by staff and students. Examples are cash prizes, awards, certificates, paid study and development leave, or recognition and awards for outstanding external stakeholders, partners or alumni who actively engage in and/or contribute to entrepreneurship promotion.

(6) Encourage the use of seasoned and respected business leader(s) to serve as entrepreneurs-in-residence and a consultation panel of external stakeholders (e.g., entrepreneurs, industry experts) to review the universities' entrepreneurship-related programmes and projects.

CHAPTER 4. ADVANCING ENTREPRENEURIAL UNIVERSITIES IN SOUTH AFRICA

Executive summary

The present study represents a review of the existing efforts aimed at creating entrepreneurial universities in Africa. It was commissioned by ECA as part of a four-country study. The findings from the study will inform ECA and the Entrepreneurship Development in Higher Education programme in terms of their investments, efforts and time devoted to promoting entrepreneurship. The work was not designed to assess the enterprising efforts of the university, but rather to review how well the institution is positioned to promote and nurture the development of an entrepreneurial university.

The sample size of 16 was drawn from three universities in South Africa, namely Durban University of Technology, Nelson Mandela University and Stellenbosch University. [10] Respondents were identified based on their involvement, management, oversight or authority in entrepreneurship. A mixed-method approach involving both quantitative and qualitative data was employed through a survey questionnaire and semi-structured interviews. The survey is based on the ECA framework for advancing entrepreneurial universities in Africa, which was developed on the basis of *A Guiding Framework for Entrepreneurial Universities*, developed by the European Commission and OECD (for details, see chapter 1).

The study illustrates that the three universities all subscribe to and have committed to becoming entrepreneurial through strategic and implementation-based imperatives, enabling policies and the allocation of resources. All 16 respondents had a differentiated understanding of what an entrepreneurial university is. However, all of their understandings spoke to an expansion of the traditional higher education model of research, teaching and learning only. The notion of an entrepreneurial university was understood in terms of its qualities of continuous reviews and of utilizing its research, teaching and learning for relevance, responsiveness, the development of students for a changing world, and its added value for and impact on local and regional development.

All three universities agreed that there was a need for the development of entrepreneurial universities in South Africa and the rest of Africa, and value in such development. The universities showed evidence of an evolution towards being more entrepreneurial, albeit in different ways, with varying degrees of success with their current initiatives, and with imminent plans for increased development in entrepreneurship. The results generally indicated a strong commitment and support from senior leadership, with the ownership and accountability for entrepreneurship at two of the universities located at the deputy vice-chancellor level. The three universities demonstrated different priorities and focus on their endeavours in entrepreneurship: Durban University of Technology was focused on innovation and producing adaptive students; Nelson Mandela University on strategic resource mobilization and partnerships; and Stellenbosch University on the commercialization of intellectual property through the establishment of spin-out companies. Some common findings were the need for: a measurement framework for entrepreneurship interventions and impact; incentives and capacity-building for staff; generation of more relevant research; and sharing of knowledge and best practices. Common challenges were: sustainable funding; new experiential teaching and learning methods; entrenched bureaucracy and mindsets; and a lack of dedicated time for entrepreneurship and innovation.

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[10] For additional information on the three universities, see: Durban University of Technology (www.dut.ac.za/); Nelson Mandela University (www.mandela.ac.za/Leadership-and-Governance/Strategy-Vision-2030); and Stellenbosch University (www.sun.ac.za/english).

All three universities demonstrated a high level of engagement with their local communities and some strong partnerships. Some notable developments from the universities, in addition to their strategic and implementation plans, were: the approval of entrepreneurship policies; the establishment of independently registered technology transfer entities; incubators and the placement of entrepreneurship champions; and the appointment of coordinators and innovation committees in faculties. Overwhelmingly, the survey results corroborated the findings from the interviews with minimal exceptions, most of which appear to be linked to a lack of information on certain imperatives that were measured in the survey.

The findings also indicated support for the role and contribution of the Entrepreneurship Development in Higher Education programme in raising awareness and establishing buy-in from senior management, and for the contribution of the work of the communities of practice. The annual lekgotla and capacity-building workshops were recognized as critical to adding value to entrepreneurship development in higher education over the previous five years.

All respondents agreed that the framework for advancing entrepreneurial universities in Africa was suited to guiding the development of entrepreneurial universities in South Africa and across Africa.

The primary objective of the nine recommendations is to provide guidance to ECA and the Entrepreneurship Development in Higher Education programme for programme development and investments for universities. The recommendations also contribute to providing a deeper understanding of the complexity, needs, challenges and status quo of the universities' internal and external entrepreneurship systems. This deepened understanding has the potential to facilitate enablement, support, resource mobilization, linkages, integration and partnerships to optimize an entrepreneurial culture and systems within and among the universities for a positive socioeconomic impact and student development. The recommendations were:

- An audit and baseline study of all the universities' entrepreneurship activities and initiatives

- Development of a monitoring and measurement framework for entrepreneurial universities

- Mapping and an audit of the external system and partnerships

- Establishment of a centralized research repository for knowledge and information

- Development of a national policy for entrepreneurial universities

- Mapping of the different capacities and skills required for entrepreneurial universities and systems

- Exploration of how and by what means staff support for entrepreneurship in universities can be incentivized

- Sustainable funding for entrepreneurship activities

- Critical advocacy carried out by the Entrepreneurship Development in Higher Education programme in its coordinating, leading, knowledge management and capacity-building role

The challenge in building entrepreneurial universities is to be mindful of the other challenges in the South African and higher education context, and to ensure that the developments do not perpetuate or increase challenges and inequalities, but rather constitute added value at all levels.

1.   Background of the study

While the concept of the entrepreneurial university is not entirely new, and its benefit and value have been identified and acknowledged, the commitment and investment to its evolution and development are emerging in Africa. Simply understood, the entrepreneurial university expands the university's role beyond its core mission of teaching and research to contribute to economic development through knowledge transfer and the commercialization of its intellectual property. This expansion calls for changes to various strategies, planning, leading, operating, teaching-learning, research, partnering, measuring and cultural imperatives for the university (Musau, 2017). The concept of an entrepreneurial university is further explored and explained in the literature review section.

South Africa is one of the four countries across Africa invited to participate in this ECA study. Universities South Africa, through the Entrepreneurship Development in Higher Education programme, was identified as the implementing partner for the South African component of the study, on behalf of the Department of Science and Innovation and the Department of Higher Education and Training.

Universities South Africa is a membership organization representing the 26 public universities in South Africa. The aim of Universities South Africa is to promote a more inclusive, responsive and equitable national system of higher education to advance the key mission of research, teaching and learning and community engagement (Universities South Africa, 2019). This project is enabled through a multilateral agreement between ECA, the Department of Science and Innovation, the Department of Higher Education and Training and Universities South Africa.

The Entrepreneurship Development in Higher Education programme is ideally placed to carry out the study as its objectives are aligned with one of their three key objectives, namely, supporting the development of entrepreneurial universities in South Africa. The plan of the programme was already to conduct a study on entrepreneurial universities, a recommendation that had emerged from one of the programme's recent studies, the "National university entrepreneurship ecosystem baseline report", on the entrepreneurial systems at the 26 public universities in South Africa, which is detailed in the next section of the present report (Achampong, Hill and Yannakaris, 2020). The present ECA study thus constitutes the initial part of the study, the second part of which will be expanded to include the other 23 public universities, scheduled for late 2021 or 2022. The findings will contribute to a national policy framework for entrepreneurship in higher education.

2.   Entrepreneurship and the South African higher education context

Entrepreneurship is being touted as a panacea for many economic development and other challenges in South Africa, namely job creation, poverty alleviation, increasing rates of inequality, innovation, community development and solutions generation. As such, there are numerous policy imperatives, private and public multisectoral programme initiatives, dedicated funding from various sources and entrepreneurial systems that provide end-to-end support to entrepreneurs and small businesses. Some examples are the Small Enterprise Development Agency, the Small Enterprise Finance Agency, the Industrial Development Cooperation and the National Youth Development Agency.

Included in the basket of economic woes is the high rate of unemployment in South Africa, and within that, the higher youth unemployment rate. According to Statistics South Africa, the official unemployment rate for the first quarter of 2021 was 32.6 per cent, of which 59.5 per cent were young people, translating into a youth unemployment rate of 46 per cent (Statistics South Africa, 2021). The Higher Education Management Information System determined that South African universities produce about 190,000 new graduates per year. Based on the 2019 Quarterly Labour Force Survey, the formal market only absorbs an estimated 41,000 graduates each year (Steynvaart, 2020). This makes for a dismal and unsatisfactory status quo, both for the country and for the young people (including graduates).

Table 4.1 contains information some of the relevant government partners and stakeholders in entrepreneurship in the higher education context.

Table 4.1
Public sector stakeholders

Public sector departments	*Mandates*
Department of Higher Education and Training	The Department's mission is to develop capable, well-educated and skilled citizens who can compete in a sustainable, diversified and knowledge-intensive international economy, which meets the development goals of the country.
Department of Small Business Development	To lead and coordinate an integrated approach to the promotion and development of entrepreneurship, small businesses and cooperatives, and ensure an enabling legislative and policy environment to support growth and sustainability.
Department of Science and Innovation	The Department of Science and Innovation seeks to boost socioeconomic development in South Africa through research and innovation. To achieve its goals, the Department provides leadership, an enabling environment and resources for science, technology and innovation.
State-owned enterprises	There are various State-owned enterprises that report to the various government departments that have direct or indirect intersectionality with higher education entrepreneurship development.
Provincial government departments	Departments related to entrepreneurship development.
Local government departments	Departments related to entrepreneurship development.
Department of Economic Development	The Department of Economic Development is the department of the Government of South Africa responsible for economic policy, economic planning and economic development. (Not shown on the diagram above.)

Source: Author, based on various public sources.

Not included in the stakeholder framework are other relevant government funding and support agencies, namely the Small Enterprise Finance Agency, the Industrial Development Cooperation, the National Youth Development Agency and the Technology Innovation Agency, that are relevant to developing entrepreneurship in universities. As well as the public departments, there are the private sector players, as indicated in the diagram above. These, together with the universities and their local contexts, make for a complex and diverse landscape for supporting, developing and optimizing entrepreneurship development in higher education. This will require consolidation, coordination and

collaboration between the various players. Investigating the relationship and linkages between the various players was not one of the aims of the present study, but it should be an area for further investigation.

An added consideration in building entrepreneurial universities is the wider socioeconomic context. Some of the socioeconomic imperatives have already been mentioned earlier in this section. Added to this is the impact of COVID-19 on the economy, which was already struggling with a growth rate of 0.2 per cent at the start of 2020. According to one source, South Africa was downgraded to negative, the budget deficit widened to 4.5 per cent and household debt constituted over 34 per cent of gross domestic product (Naidu, 2021). At present, the priority and focus of the Government are on its Economic Reconstruction and Recovery Plan (South Africa, 2020), which lists skills development as one of its drivers. The plan offers opportunities for universities to partner with the Government to deliver on implementation imperatives and unlock government funding.

The internal context of universities presents its own set of challenges, complexities and considerations in the quest to become entrepreneurial. The #FeesMustFall campaign, which was a protest against the cost of higher education and decreasing government funding support (the Government announced a decrease in financial support for students in 2021), demanded free and decolonized education. This brings into focus both the cost of education and the decolonization of teaching and learning. Student poverty in universities has become an increasing problem. A study conducted by the University of the Free State, to inform a multidimensional student poverty index, found that students face a host of challenges and problems. These were categorized into basic needs, essential resources for learning and living as a student, the living conditions and living arrangements of students, freedom of participation, and aspects of physical and psychological well-being (Ruswa, 2019). University responses to COVID-19 have also had implications. For many students, online learning has been challenging in terms of access for disadvantaged students and the loss of social interactions and relationships that form networks and alliances. For other domestic universities, infrastructure, technology and resource constraints have presented a challenge in pivoting to an online teaching medium.

A continuing imperative and challenge for South African universities is their transformation agenda, informed by the Higher Education Act, which sets out its aims to "establish a single coordinated higher education system", "restructure and transform programmes and institutions to respond better to the human resource, economic and development needs" of South Africa, "redress past discrimination and ensure representativity and equal access" and "contribute to the advancement of all forms of knowledge and scholarship, in keeping with international standards of academic quality." It was also proclaimed in the Act that higher education institutions should enjoy freedom and autonomy in their relationship with the State within the context of public accountability and the national need for advanced skills and scientific knowledge (Badat, 2010).

The entrepreneurial university in South Africa thus needs to take this plethora of contextual factors and variables into consideration. Some of these factors offer enablement and opportunities, while others are indicative of the many challenges that the country and universities are dealing with presently. Universities should therefore be entrepreneurial in their approach to add value, be responsive and relevant, and navigate the present context in order not to perpetuate the current problems or instigate new challenges.

3.   Research methodology

This review aims to assess how three universities in South Africa are positioned to promote, nurture and drive entrepreneurship in their institutions and local contexts. As already mentioned, the review was commissioned by ECA, as part of a four-country study. The research methodology was designed by ECA for use across the five countries to ensure standardization.

A mixed-method approach (quantitative and qualitative) was followed to review the activities identified as characteristic of an entrepreneurial university. Specifically, the review encompassed a survey, followed by semi-structured interviews and supplemented by information from the university's websites, which allowed for triangulation. The review included a desktop review of entrepreneurial university frameworks, issues, challenges and emerging practices. A task team was established from members of the Community of Practice for Entrepreneurial Universities who guided sample selection, and the framing and analysis of the report.

The survey instrument was adapted from the Guiding Framework for Entrepreneurial Universities and was developed as a collaborative project between OECD and the European Commission in 2012. It is a popular emergent framework used to understand, measure and give effect to entrepreneurial universities. The framework encompasses seven attributes based on international case study work on university entrepreneurship support and the theoretical debate on the role of universities in generating entrepreneurial motivations, intentions and competencies (OECD and European Commission, 2012).

In addition to the survey, one-on-one semi-structured interviews were conducted with respondents after they had completed the survey. The interviews were scheduled after completion of the survey to allow for an understanding of the attributes considered descriptive of an entrepreneurial university. See Annex 2 for the guiding questions for interviews.

The three universities – Durban University of Technology, Nelson Mandela University and Stellenbosch University – were selected based on their involvement in the communities of practice for entrepreneurial universities of the Entrepreneurship Development in Higher Education programme. Purposive sampling was applied to optimize and maximize the breadth and depth of knowledge, experience and opinions in order to get as complete a picture as possible. Five respondents per university were identified based on their involvement, management, oversight or authority in the seven sections of the study. For Nelson Mandela University, there were six respondents, after one of the respondents suggested an additional person. The involvement of members of the programme's communities of practice allowed for easier access, and a simpler introduction to the university systems and navigation of the administrative requirements. The final number of respondents interviewed was 16.

Table 4.2
Breakdown of research participants

University	Respondents	Male	Female	Positions
Durban University of Technology	5	0	5	Two Deputy Vice-Chancellors; Director of Department; two entrepreneurial desks
Nelson Mandela University	5	2	3	Two Deputy Vice-Chancellors; Director of Research; Dean; entrepreneurship specialist
Stellenbosch University	5	3	2	Deputy Vice-Chancellor; Chief Executive Officer: Incubator; Professor; Research Manager; Chief Executive Officer of a spin-off company

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

The task team took a decision to apply for ethical clearance and gatekeeper status from the participating universities. Despite requests for expedited processing of these applications, the delay in receiving clearance had a major impact on the timeline, with applications taking two months to be approved in some cases. Letters of introduction and information were submitted to all research deputy vice-chancellors at the three universities.

The survey data were collected using an online survey, with a seven-point Likert scale created using Google Forms. The collected data were then analysed using Microsoft Power BI and, in some instances, converted into graphs. ECA advised that, owing to the small sample size, a percentage of each scale might not be representative, and the responses from the seven-point Likert scale should be consolidated into a three-point scale: fully disagree/strongly disagree/disagree was consolidated into one point; neutral was the second point; and fully agree/strongly agree/agree constituted the third point. These three points are illustrated in the graphs used.

The preliminary results of the study were presented to stakeholders of the project: the Department of Science and Innovation, the Department of Higher Education and Training, members of the communities of practice for entrepreneurial universities of the Entrepreneurship Development in Higher Education programme, ECA, representatives from the research teams from Ethiopia and Ghana, and Universities South Africa. Feedback, comments and suggestions from the stakeholder workshop have been incorporated into the present report.

4.   Results

4.1   Durban University of Technology case study

The following case study was constructed from the interview transcripts, supplemented by information obtained from the website of Durban University of Technology. The results of the survey are included. Five female respondents completed the survey and were interviewed: two deputy vice-chancellors; one senior department head; and two staff members working at entrepreneurship centres. This provided for varied perspectives from different portfolios and with different experiences within the university. Note that not all of the respondents shared all of the information, and the case study was crafted from the different perspectives (in some cases, the same or similar) of the respondents, which were then supplemented by information from the Durban University of Technology website.

Durban University of Technology came into being as result of an April 2002 merger of two Technikons, ML Sultan and Technikon Natal. It operates from seven campuses located in two cities (Durban and Pietermaritzburg) and has approximately 35,000 students, studying across six faculties: Accounting and Informatics; Applied Sciences; Management Sciences; Engineering and the Built Environment; Health Sciences; and Arts and Design. The university considers itself to be at the forefront of higher education, technological training, research, and innovation. In 2020, it was ranked among the top 500 universities globally, tenth for citations globally and fifth nationally, according to the Times Higher Education World University Rankings. On its website, it states that – in line with the objectives of its ENVISION2030 strategy (Durban University of Technology, n.d.) – by 2030, the university would like:

- People to be creative, innovative, entrepreneurial and adaptive to changes in the world

- People to participate productively in the development of our region, country and the world

- State-of-the-art infrastructure and systems to enhance a system to achieve this vision

4.1.1 Entrepreneurial developments

In 2018, Durban University of Technology initiated an awareness-raising process, speaking to staff about their focuses and intention to transition to become an entrepreneurial university. A review of its entrepreneurial system was carried out in March 2019, resulting in specific recommendations. The university's commitment to becoming an entrepreneurial university is demonstrated through its ENVISION2030 statement and by the milestones, developments and successes listed in this section.

4.1.1.1   The Durban University of Technology ENVISION2030 plan

The Durban University of Technology ENVISION2030 plan clearly articulates the institution's commitment to transitioning to become an entrepreneurial university. The aim is to change what the university terms its DNA in order to give effect to its strategic objectives. Durban University of Technology sees its "double DNA strand" as being people-centred, innovative and entrepreneurial. These characteristics constitute the character of the institution. The strands are supported by the values, principles, ethos and culture of the university. A departure for the university is a move away from seeing the four pillars as strategic focus areas, but rather as perspectives of stewardship, systems and processes, sustainability and society. The reasoning is that having strategic focus areas tended to silo the operations of the university along the lines of teaching-learning, research and innovation, operations and finance, and sustainability. The new strategy is scaffolded and maps out a path to their impact. There is an interdependency between the perspectives, which allows for a multidisciplinary, cross-institutional approach to their implementation. Ultimately, the impact of ENVISION2030 is in improving lives and livelihoods.

The strategy was informed by the question: how can innovative solutions to challenges be used to have an impact on society in a transformative way? The responses to this were as follows:

- To have "a dynamic and innovative solutions-focused interaction with and impact on society at both the local and global levels"

- To have "an integrated approach that considers how to ensure the future of knowledge production, the environment and economic progress"

- To provide an enabling environment with coordinated and interdependent systems and processes across the institution"

- To have "a values- and principles-based collective responsibility and accountability"

4.1.1.2   Durban University of Technology student entrepreneurship policy

Durban University of Technology has developed a student entrepreneurship policy that sets out the details for student entrepreneurship support. The policy was referred to by all the respondents and seen as a positive development for entrepreneurship at the university and appears to be coordinated and managed by the Deputy Vice-Chancellor: Research, Innovation and Engagement. The policy was not available for review at the time of writing as it was in the final internal process of approval and adoption at the 2021 senate meeting. After the interviews with Durban University of Technology respondents had concluded, it was ascertained that this policy had been approved by executive management and will be made available on the university's website by the end of July 2021. From the respondents, it was ascertained that this policy is intended to set forth the role and responsibilities of the university and students in entrepreneurial development and education.

The university undertakes to develop the right content and provide the right facilitators, who will include external entrepreneurs and other knowledge or industry partners, provide start-up and incubation support, and offer seed funding for students, in collaboration with its quadruple helix partners. To date, approximately 15 million South African rand (R) has been allocated by the university to support student start-ups. The governmental partners for incubation support are the KwaZulu Natal Economic Development, Tourism and Environmental Affairs Department, the Agribusiness Development Agency and the Small Enterprise Development Agency, among others. There are clear guidelines, terms and conditions for acceptance and continued support for incubation and funding, which include stringent ethical and legal considerations, as well as performance criteria.

In the policy, it states that entrepreneurship is considered a life skill that all students should possess and that all undergraduate students across all faculties are expected to complete a compulsory entrepreneurial elective.

To facilitate the coordination of core and related activities across the institution, coordinators have been appointed in all faculties to ensure that policy imperatives are implemented. Already in place are centres that provide support to students and the community for start-ups, ideation, prototyping and enterprise development. However, these are not adequate for the number of existing students and there are plans to expand the facilities. It will be a challenge to successfully incubate and graduate a higher number of businesses that will, in turn, provide an alumnus who can support other emerging entrepreneurs.

There are various infrastructural plans to support the implementation of this policy. One is the establishment of coordination of the Durban University of Technology Centre for Entrepreneurship and Innovation – approved by Council of the university in November 2020 – that will be registered as a non-profit company. There is already a commitment by the university to providing the minimum running costs of the coordinating centre to continue to support student entrepreneurs both in Durban and the Midlands. These incubation spaces and support will also be open to local communities partnering with Durban University of Technology, and the focus will be on supporting businesses and innovations that are relevant and responsive to tackling local, regional and global problems. The Midlands component of the centre is presently focusing on agribusiness. In Durban, there are plans to set up the Durban University of Technology Innovation Hub, which will bring the university and

its industry and quad-helix partners together to enable joint ventures and collaboration. At present, there are fewer start-ups run by women than by men.

4.1.1.3   Leadership and management

Leadership commitment to transition to an entrepreneurial university is evident. The portfolio of the Deputy Vice-Chancellor: Research, Innovation and Engagement includes support for entrepreneurship development. This portfolio is also where the leadership, authority and accountability for entrepreneurship and innovation resides. While there are various faculties, departments and centres where entrepreneurship is evident, entrepreneurship has a direct line of ownership and accountability with this Deputy Vice-Chancellor.

4.1.1.4   Research imperatives

Under the Research, Innovation and Engagement portfolio, the university has embraced an innovative and entrepreneurial approach to supporting entrepreneurship development. Programmes on entrepreneurship are run through the Coordinating Centre for Entrepreneurship through desks in Durban and the Midlands. In addition, these desks are supported by a Technology, Transfer and Innovation unit, which plays a significant role in coordinating the Centres and driving innovation and commercialization. The Research and Postgraduate Support Directorate provides support for researchers and postgraduate students in their research endeavours, some of which include research on entrepreneurship. There are also workshops that can inspire innovation and entrepreneurial thinking for postgraduate students and staff, and proposed short courses under the Short Courses unit that will be focused on research, entrepreneurship and commercialization. These courses will be facilitated by former academics who have transitioned to become full-time entrepreneurs. These proposed short courses address some aspects of the Department of Higher Education's University Capacity Development Programme on three key development areas: student development; staff development, in particular regarding teaching, research and leadership; and management and curriculum development and reform.

The university also encourages "mode 2-type" research that is aimed at solving existing and applied problems occurring both in society and industry. Specifically, relevant research resolves challenges, generates solutions domestically and internationally, and can support industry with its research and development, which can also contribute to a third income stream for the university. The university is aware of the iterative relationship between research, teaching and learning and how this loop should stay dynamic and updated. Partnerships with the private sector and industry are also being actively pursued and set up, and these include agreements with their quad-helix partners from local government, industry, other sister universities and civil society.

4.1.1.5   Miscellaneous activities

In addition to the above, various other entrepreneurship activities are unfolding at Durban University of Technology. There is an audit of entrepreneurial courses across the university. There is dedicated support for students to develop apps, and over thirty apps have already been developed. The university sees this space as having significant potential for development. Durban University of Technology is also committed to output targets for student start-up businesses originating at the institution, which are considered an indicator for student entrepreneurship success. Durban University of Technology is also developing a survey to track its graduates' contribution to entrepreneurship outside the university.

As part of the internationalization drive of Durban University of Technology, it offers collaborative online international learning courses that are part of the International Education Association. Such courses allow both academics and students the opportunity for collaborative online teaching and learning with other universities globally, allowing for cross-sharing of curricula and exposure to different cultural contexts. Another internationalization effort is to increase the international student intake to 10 per cent and conclude cooperative agreements with universities in the Southern African Development Community region. The exposure to international content and contexts is expected to enhance the entrepreneurial orientation of students.

Durban University of Technology has an engagement platform with industry that facilitates third-stream income generation, allowing for the engagement of students and academics in providing consulting and collaborative opportunities. It covers all six faculties and allows for the insourcing of capacity if it is not available at the university. The university's policy allows for a 30:70 ratio of sharing on contract research with the university.

> "There has been much success, but the real challenge will be in the successful implementation of the strategy and policy. Leadership commitment and allocation of funds is only one step towards success."
>
> Research respondent

Training for academics on practical and experiential entrepreneurship teaching methodologies has already begun. The programme has been delayed, however, by the recent move to online teaching in the COVID-19 context.

4.1.2 Challenges

The research interviews raised the following issues perceived as institutional and other challenges in the transition to an entrepreneurial university:

- While there is a leadership commitment to entrepreneurial imperatives, the current mindset and buy-in of academics was still seen as a challenge. There is a traditional approach and acceptance of how a university should deliver on its mandate, and there are many who still subscribe to that model.

- There remain bureaucratically entrenched systems that are not open or conducive to change. University systems do not always enable entrepreneurial practices, and these systems need to be changed through intent and leadership.

- A culture of entitlement is seen to exist among some students, who expect support and success without putting in the effort. This attitude, coupled with a lack of local and global exposure, and limited or no professional mentorship and entrepreneurial networks, is seen as a challenge. The entrepreneurial short courses presented by the Centres are not regarded as core to academic study, and are considered as nice to have when competing with other activities on campus. These short courses are offered by the Centres for Entrepreneurship and Innovation and are different from the compulsory entrepreneurship courses that the Student Entrepreneurship Policy referred to above, for example, Entrepreneurial Edge offered in Management Sciences.

- There is a lack of staff members who can act as entrepreneurial role models, both in terms of their own entrepreneurial endeavours and as regards business and innovative teaching and learning. One of the respondents thought that specific capacity-building on this matter should be undertaken, with dedicated space and time for this to happen.

- There is a need for more engagement and networking with industry. Adequate infrastructure needs to be developed across the university that allows for implementation of entrepreneurial support, including spaces for networking, prototyping and sharing.

- The role of the Council on Higher Education[11] and its buy-in, recognition and enabling of entrepreneurial universities, including curriculum transformation, is considered a crucial factor in the success of transitioning to become an entrepreneurial university.

- At present, there is limited enablement of a culture for creativity and innovation. Academics and students' workloads are full, and there is no dedicated time for research, thinking and innovation. Currently most of this happens after hours and outside of the university calendar.

- One respondent found entrenched hierarchy to be a challenge. Generally, senior and long-time academics do not take easily to being lobbied, informed or taking instruction from younger colleagues.

4.1.3 Critical success factors

Respondents viewed the following as factors critical to the success of implementing efforts and transitioning towards becoming an entrepreneurial university:

- Developing and attracting the right staff with the right capacities in the right positions to drive the transition and implement the strategic imperatives.

- Sustained resourcing (including funding) of initiatives (such as competitions, related research and development, prototyping, incubation), staff (capacity development) and programmes (short courses, workshops, discussion forums) to ensure sustained and consistent activities to drive the transition to an entrepreneurial university.

- A system must be understood and utilized for engagement, networking, collaboration and partnership with industries, big and small business, non-governmental organizations and sectors, for knowledge exchange, exposure, learning opportunities and student development. This should include internships, practical learning opportunities and apprenticeships.

- More responsive teaching and learning methodologies that are relevant to the practical and applied nature of entrepreneurship needs to be developed. This should include allowing entrepreneurs and practitioners to teach at universities.

- Curriculum review, reform and refinement. The Council on Higher Education needs to allow for more flexibility to enable this to happen and model an iterative process. Curricula should include content on personal development and mastery, and sector-specific knowledge in order to understand the contextual imperatives of business.

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[11] An overview of the main areas of work of the Council on Higher Education is available at: https://nationalgovernment. co.za/units/view/90/council-on-higher-education-che.

- Establishing a dedicated space and time for innovation and entrepreneurship discussion and discourse for students and academics.

- An enabling environment, consisting of flexible structures, teams and systems that would allow and enable an entrepreneurial culture, and mitigate some aspects of bureaucracy.

- Two of the respondents suggested that the current incentive system for academics should be revised. The current system incentivizes research outputs. This should be revised to include incentives for innovation, technology and entrepreneurship.

- There should be adequate infrastructure and equipment for start-up support, prototyping and testing, for example, scaling up the existing 3D-printing facilities for students and academics.

- Visionary leadership at the senior level is key, and leadership to manage and drive the process of change towards becoming an entrepreneurial university. In addition, all change processes in this regard should be accountable and aligned with the governance of the university.

- To establish a plan and processes for the commercialization of intellectual property and the establishment of spin-off companies.

- A monitoring, evaluation and impact measurement framework should be developed to track activities and measure the outcomes and impact of interventions. This also allows for evidence-based accountability.

4.1.4 Survey results

As mentioned in the research methodology, the survey was based on and adapted from the framework for advancing entrepreneurial universities in Africa. The survey results cover findings on the seven attributes and the additional question 8 that covers the strategy and mission, support for entrepreneurial programmes, and budget and finance. The findings for the first seven attributes are illustrated with three-point graphs, which were consolidated from a seven-point Likert scale, as explained in the Research Methodology section.

4.1.4.1 Leadership and governance

The lowest score (of 60 per cent) for these statements was in relation to departments empowered to generate innovative ideas and bring them to market. All other questions received a score of 80 per cent. Two statements ("The university is active in driving entrepreneurship development in the wider region and community" and "There is a strong commitment at a high level of the university to implementing the entrepreneurial strategy") received 100 per cent agreement.

Figure 4.1
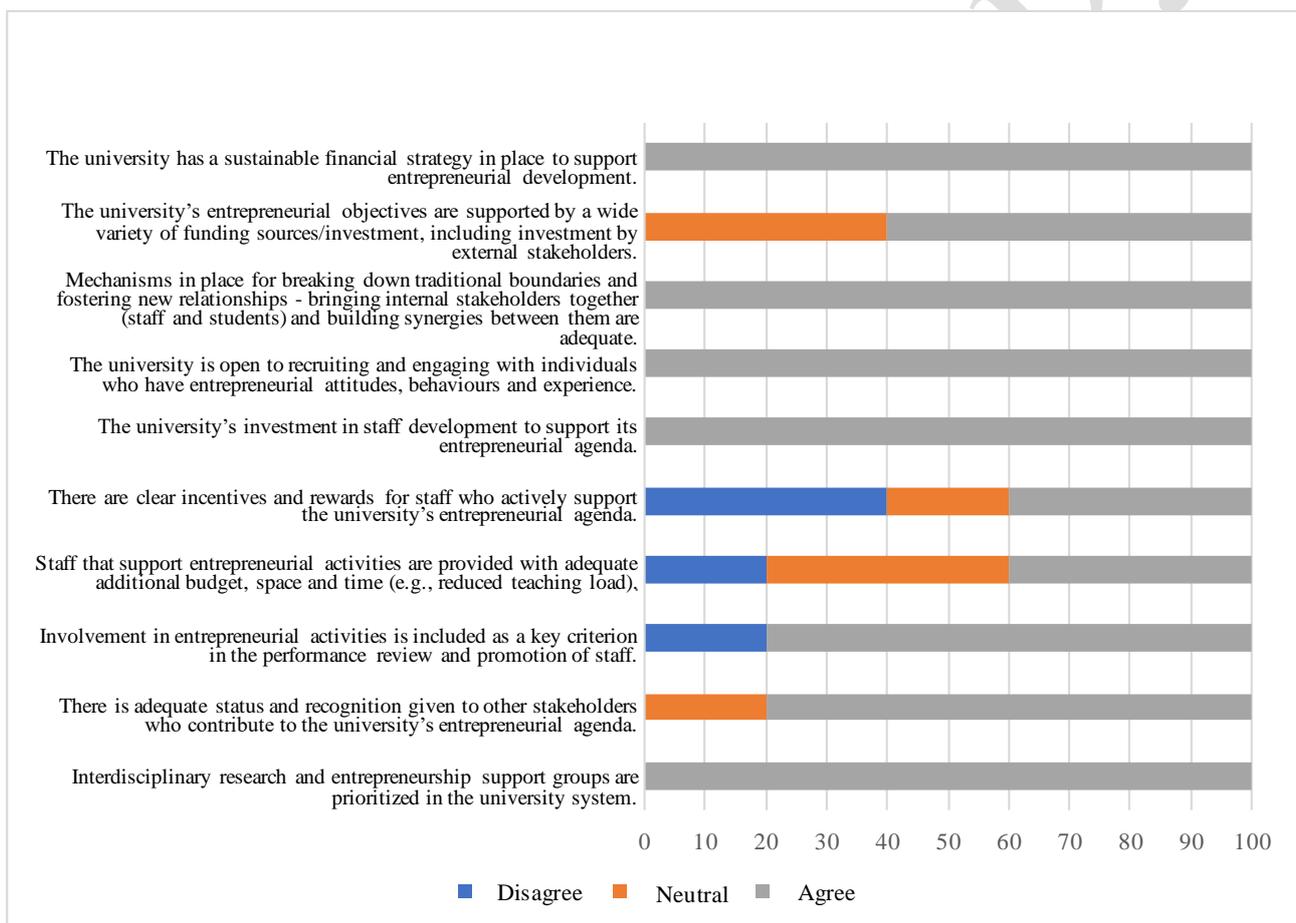**Durban University of Technology – leadership and governance**
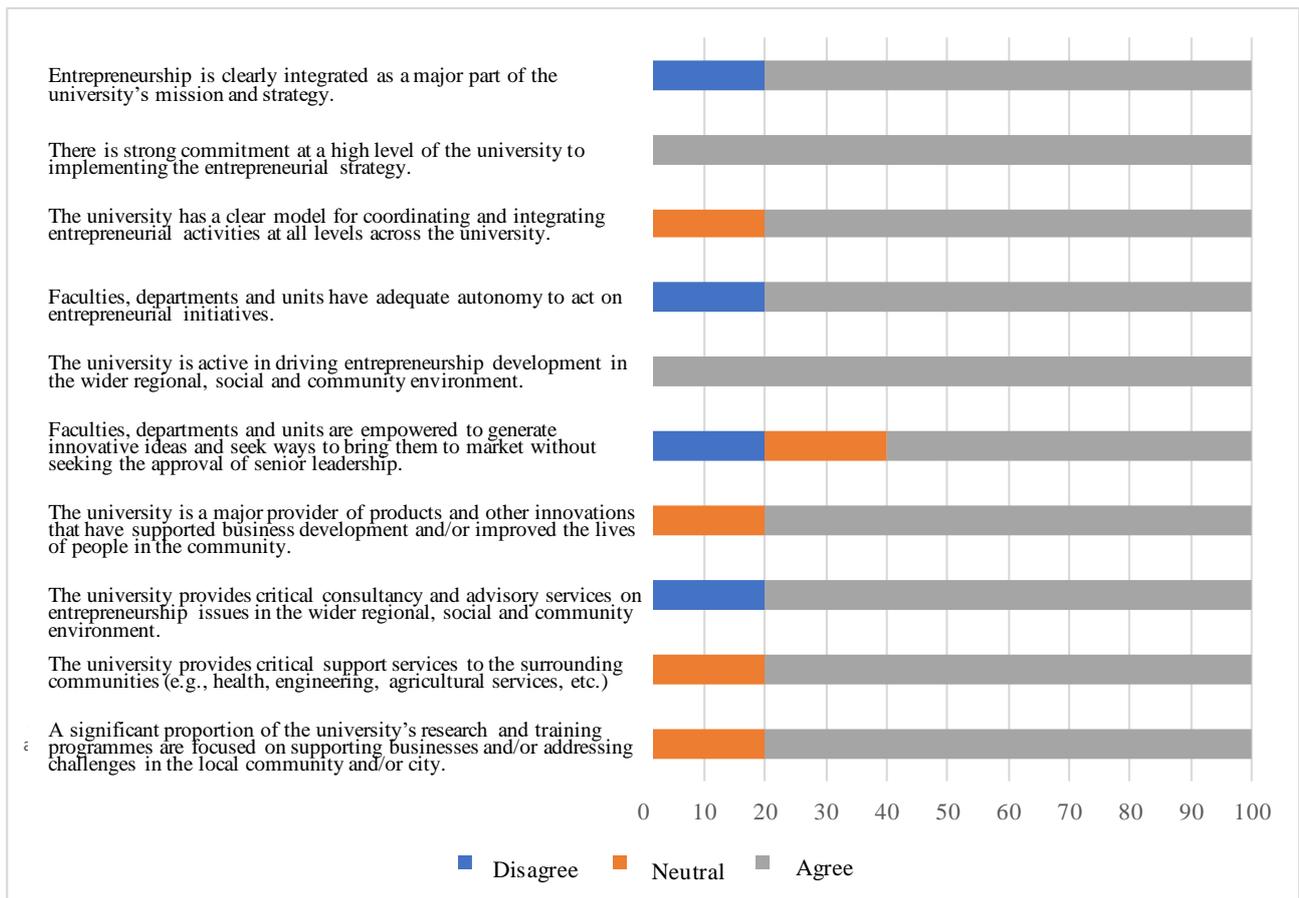
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.2 Organizational capacity, people and incentives

There was 100 per cent agreement with 5 of the 10 statements. One of the lowest agreement scores (of 40 per cent) indicated a 40 per cent neutral score, relating to the provision of an adequate budget for entrepreneurial activities. The statement on the existence of variety of sources of funding for entrepreneurial development yielded a rate of agreement of 60 per cent, and the question relating to a sustainable financial strategy in place for entrepreneurial development presented 100 per cent agreement. The other lowest score (of 40 per cent) related to incentives and rewards for staff who actively support entrepreneurship development. There was 100 per cent agreement with the statements on staff development, the prioritization of interdisciplinary research and entrepreneurial support groups, breaking down traditional boundaries, and recruiting and engaging individuals with entrepreneurial attributes.

Figure 4.2
Durban University of Technology – organizational capacity, people and incentives

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.3 Teaching and learning development

There was 100 per cent agreement on four of the eight areas, namely: the engagement of external stakeholders in teaching and learning; strong support for entrepreneurial behaviour; research results being integrated into education and training; and the regular validation of entrepreneurship outcomes. Moreover, 40 per cent of respondents agreed and 40 per cent were neutral as regards the

entrepreneurial training of staff taking part in all parts of the university. In addition, 60 per cent were neutral as to whether the university checks the extent to which entrepreneurship is integrated or included at the school level.

Figure 4.3
Durban University of Technology – entrepreneurship development in learning and teaching
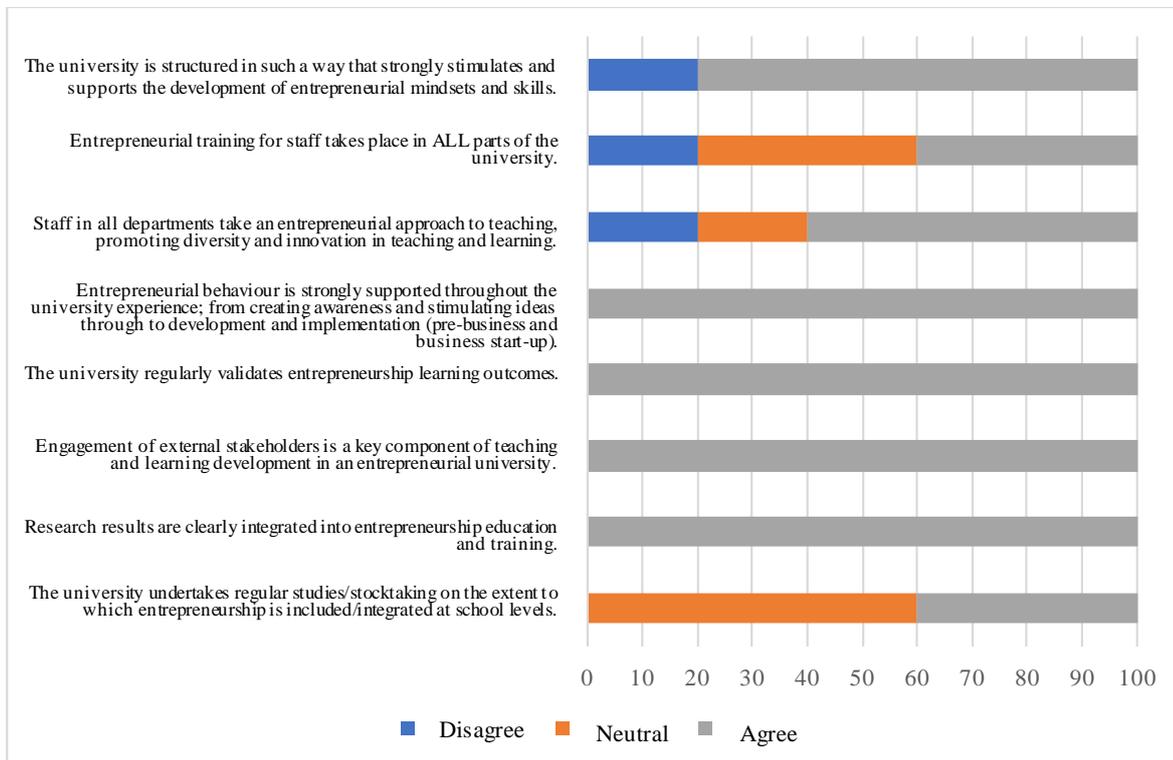
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.4   *Pathways for entrepreneurs*

The results showed a 100 per cent score on all statements under this attribute, which indicates end-to-end support for entrepreneurship development for both staff and students.

Figure 4.4
Durban University of Technology – pathways for entrepreneurs

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.5 University-business/external relationships for knowledge exchange

This area also indicated high activity, with an 80 per cent score on two statements and a 100 per cent score on the other.

Figure 4.5
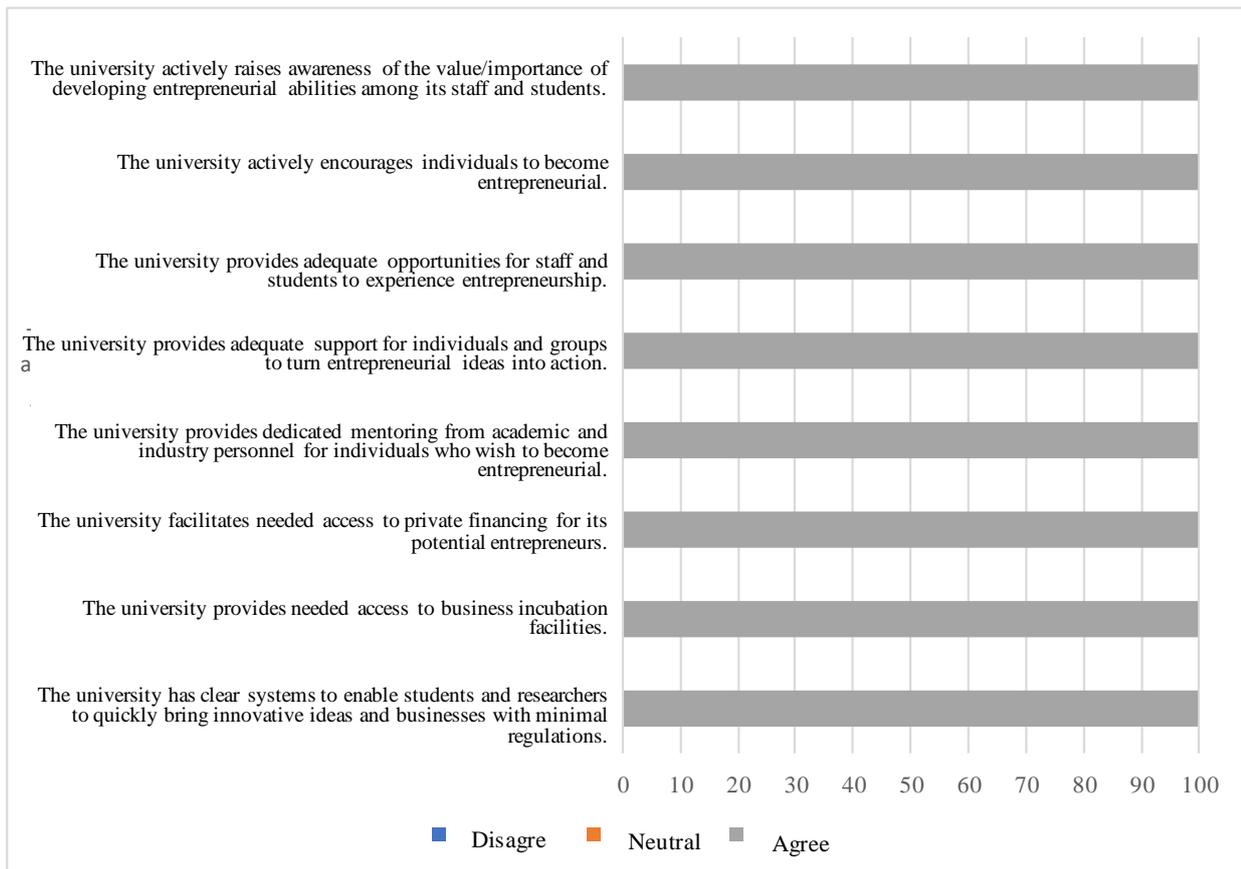**Durban University of Technology – university-business/external relationships for knowledge exchange**

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.6 *The entrepreneurial university as an international institution*

Figure 4.6
Durban University of Technology – the entrepreneurial university as an international institution

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

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This question indicated a high level of internationalization activity, with all statements receiving a rate of 100 per cent support.

4.1.4.7   Measuring the impact of the entrepreneurial university

The responses indicated a high level of activity in relation to the attributes measured.

Figure 4.7
Durban University of Technology – measuring the impact of the entrepreneurial university

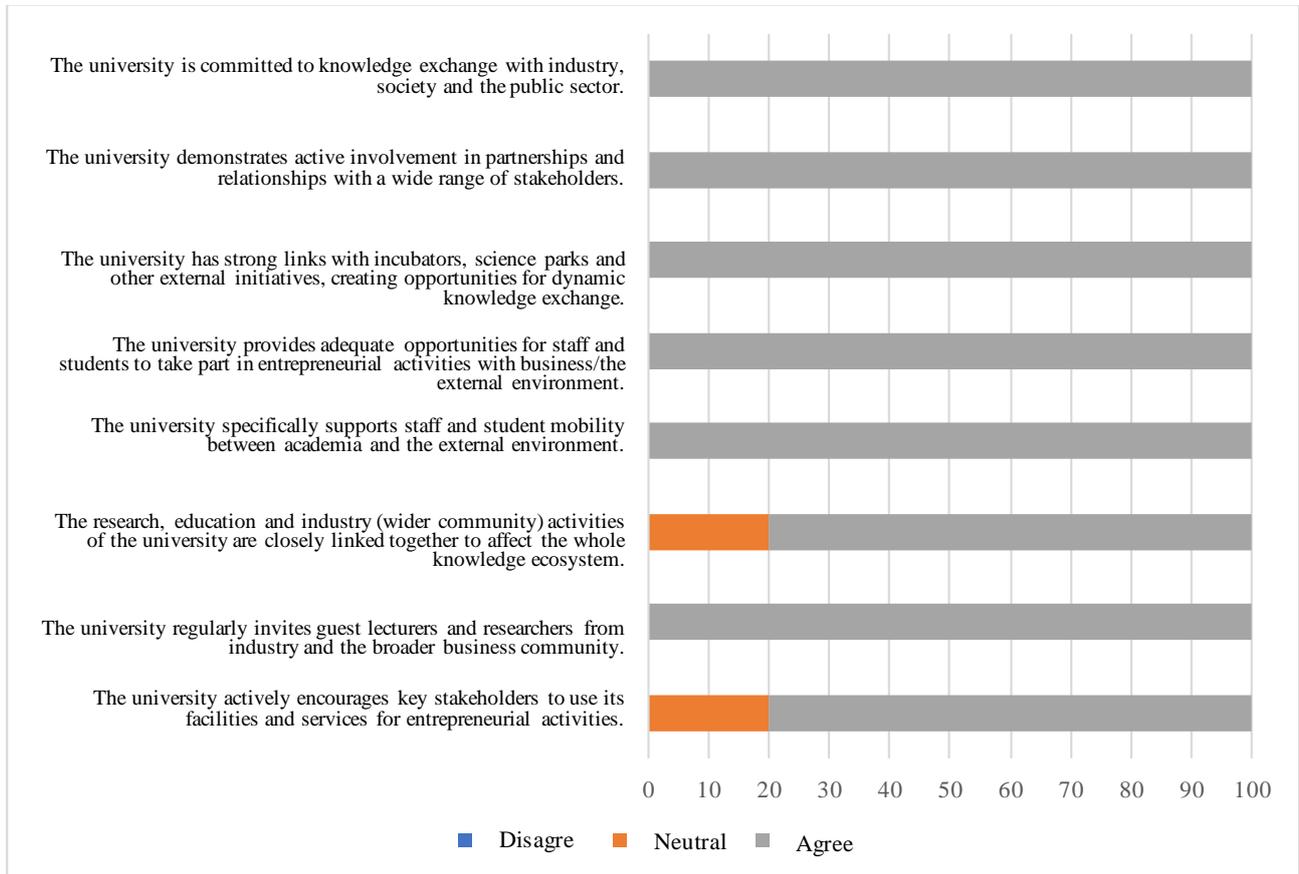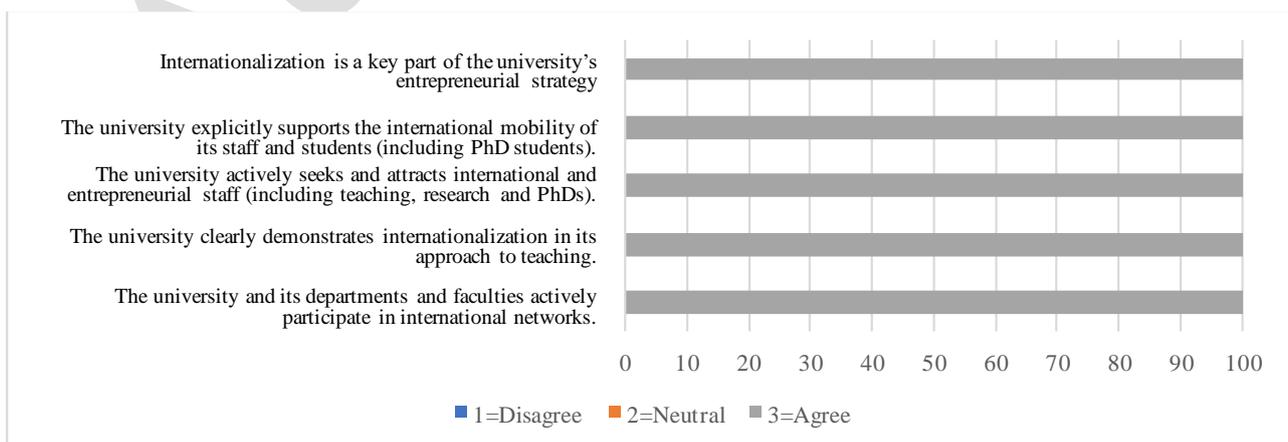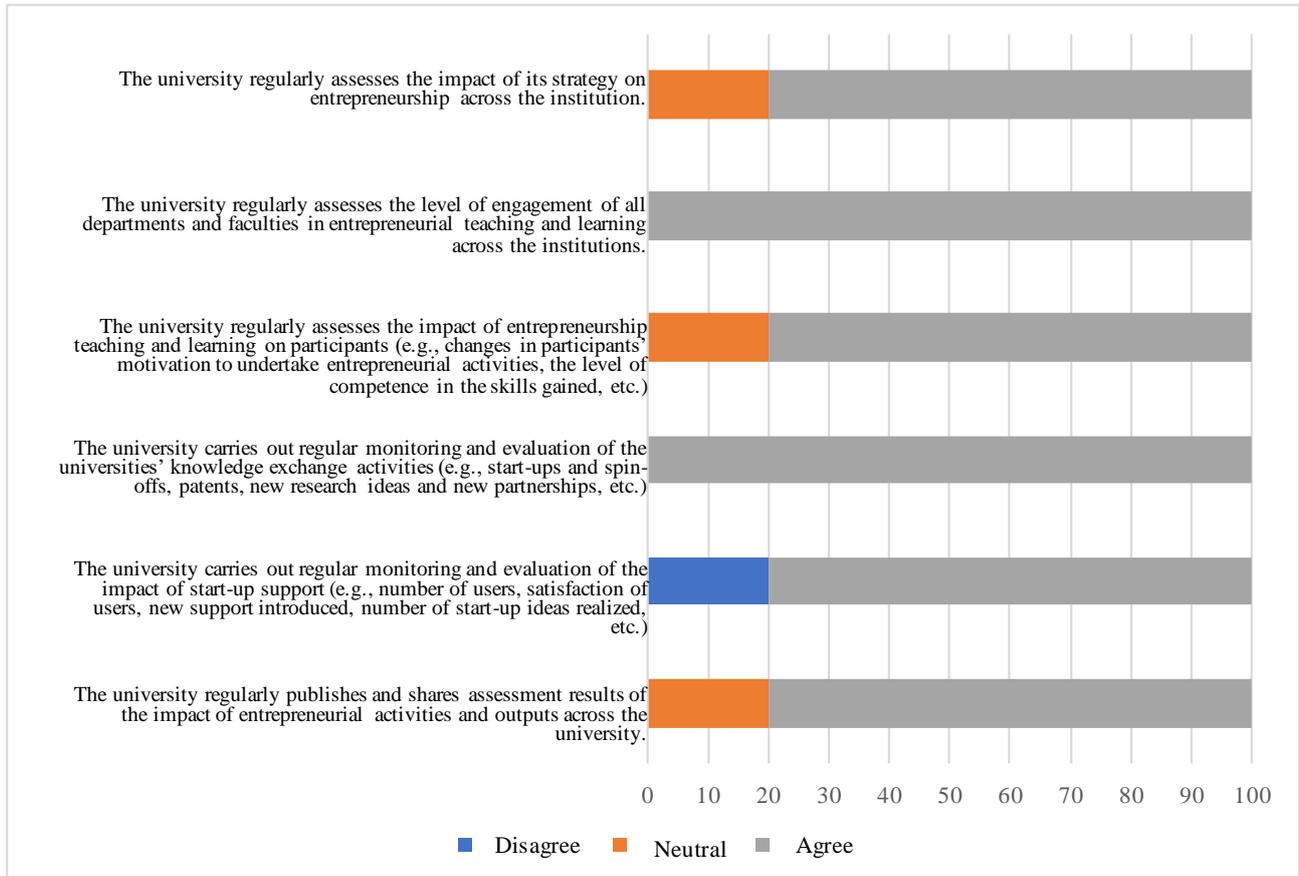*Source:* United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.8   University mission and strategy

Between 80 per cent and 100 per cent of respondents indicated that five out of the six areas were included in the mission and strategy of Durban University of Technology. Only 60 per cent indicated that incubation was included.

4.1.4.9   Areas with an implementation plan

According to the table 4.9, 100 per cent agreed with the statements on two areas (entrepreneurial learning and teaching, and business start-ups/spin-offs), and 80 per cent agreed on two other areas (knowledge exchange and internationalization) as having specific implementation plans. Only 60 per cent thought that there was a plan on incubation and technology transfer.

Figure 4.8
Durban University of Technology – university mission and strategy
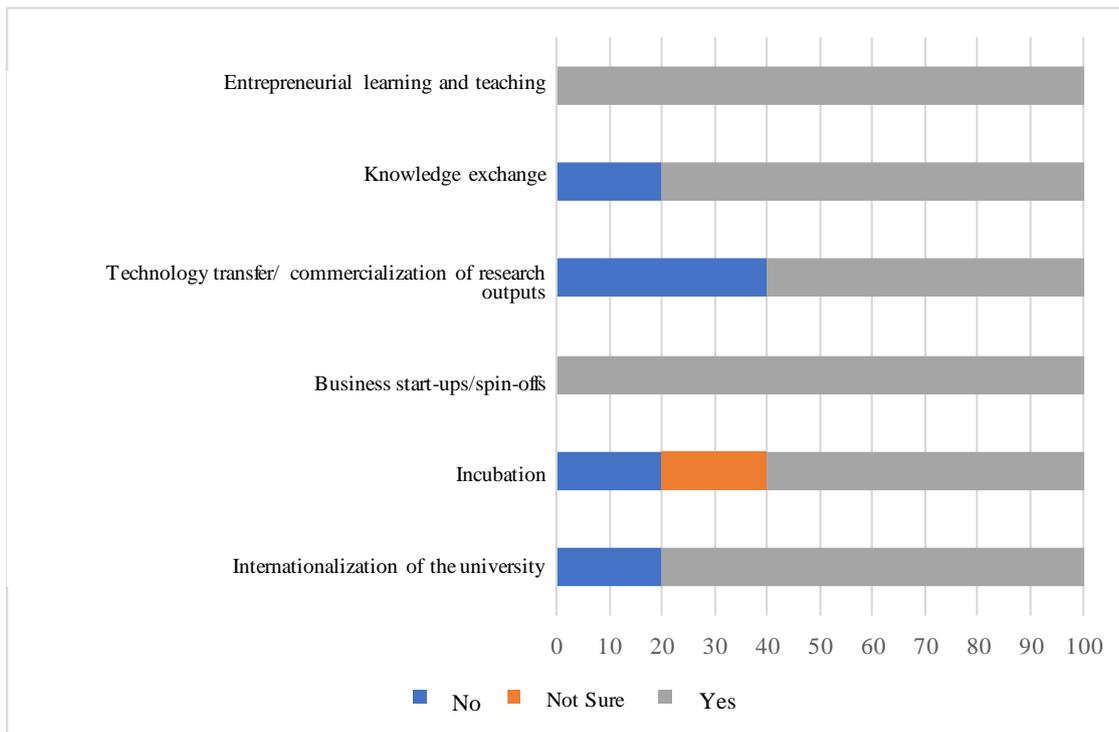
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.4.10 Availability of entrepreneurship support structure, services and programmes

Overall, 15 of the 21 statements received a response of "Yes" from 80 per cent to 100 per cent of respondents, and 4 statements had a 60 per cent response rate of "Yes". Moreover, 60 per cent indicated that there was no recognition or award for outstanding external stakeholders, partners or alumni who actively engaged in and contributed to entrepreneurship promotion. On the question of a joint degree or research programme with international partners, 40 per cent agreed, 40 per cent disagreed and 20 per cent were unsure.

4.1.4.11 Budgeting and finance

This question explored whether funding for certain areas of the entrepreneurial strategy, and the sources thereof, had increased in the last three years. In total, 60 per cent agreed that budget allocation from domestic public and private funding had grown, while respondents did not know or were not sure of foreign public and private funding sources. Between 80 per cent and 100 per cent agreed that the budget for all of the areas measured has increased over the last three years.

Table 4.3
Funding for implementation of the entrepreneurial strategy of the university: Durban University of Technology
(Percentage)

Funding for implementing the entrepreneurial strategy of the university	*Yes, it has grown*	*No, it has not grown*	*No funding from source*	*No information/not sure*
a. Entrepreneurial activities (direct)	80	20		
b. Entrepreneurial support services/activities	80		20	
c. Internationalization activities	80			20
d. Knowledge exchange and engagement activities with external parties	100			
e. Staff training and development focused on entrepreneurial-related knowledge and skills	100			
f. Reinvestment of entrepreneurial incomes of the university	40	20	20	20
g. Domestic public funding	60	20		20
h. Domestic private funding	60	20		20
i. Foreign public funding	20	20		60
j. Foreign private funding		40		60

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.1.5 Conclusion (Durban University of Technology)

All respondents indicated their awareness of the commitment of Durban University of Technology to becoming an entrepreneurial university. While the understanding of the concept and definition of an entrepreneurial university varied slightly among respondents, the strong consensus was a response of "Yes" to the statements on the importance of the transition for Durban University of Technology, that change was imperative, had been committed to, and that certain aspects of how (in terms of learning and development), what (curriculum reform), with whom (knowledge partners) and for whom (industry, socioeconomic development, the country) the university delivers on its mandate must change. The university has made entrepreneurship front and centre in its the ENVISION2030 strategy in clear language, with consideration of the imperatives of resourcing, enabling and implementation to achieve the strategic objectives. What emerged was a Durban University of Technology design and delivery concept of an entrepreneurial university as having a flexible internal commitment and culture that supports end-to-end entrepreneurial development, produces graduates and research relevant and responsive to the local and global socioeconomic context and needs, and supports a third-stream income and mission. Durban University of Technology is looking to produce what they term an "adaptive graduate", one who will be able to innovate

business models for the twenty-first century, start businesses and thereby create jobs, be employable so as to be absorbed into industry and produce the necessary solutions. Ultimately, all respondents saw the university's responsibility as being beyond research and teaching and learning, to improving lives and livelihoods. As such, there appears to be a commitment to building both an internal system to support entrepreneurship development and an understanding of how to identify and be part of an external entrepreneurial system.

The survey results supported the case that was made from the interviews, with mostly positive and affirmative responses. It did, however, raise some issues for consideration. While there were high scores and inputs indicating strong leadership and a commitment to being entrepreneurial, a critical factor that emerged was the need for differentiated leadership: "need for visionary leadership is key for the processes to be accountable and aligned with governance of the university, as is leadership through the process of change." Besides the response to the question on departments empowered to generate and innovate ideas and to bring them to market (with which 60 per cent agreed), 80 per cent of more of respondents agreed with all other statements. Two statements received a rate of 100 per cent agreement: "The university is active in driving entrepreneurship development in the wider region and community"; and "There is strong commitment at a high level of the university to implement the entrepreneurial strategy". These findings are consistent with the findings from the interviews, which indicated leadership and governance support and actions aimed at entrepreneurial development.

Accountability for entrepreneurship rests with the Deputy Vice-Chancellor: Research, Innovation and Engagement. The institution has thereby ensured authority and accountability at the senior level to provide the agency required to drive some of the changes and actions required for successful implementation. The degree of involvement of other senior management was unclear. An interesting observation was that the leaders and drivers for change to become an entrepreneurial university are all women, yet the number of women starting businesses on campus is smaller than the number of men doing so.

The student entrepreneurship policy stipulates that all students will take an entrepreneurship course, and targets have been set for student start-up businesses, thereby enabling monitoring and measurement. Staff, funding and infrastructure has been allocated for implementation of the policy. Of note – and a pioneering move in the South African higher education entrepreneurship system – are the placement and roles of entrepreneurial coordinators across all faculties. The survey results indicated a 100 per cent positive score for pathways, a score of between 80 per cent and 100 per cent for support and activities, and an increase in the budget for certain entrepreneurial activities over the last three years, demonstrating financial support for entrepreneurship.

The framework for an entrepreneurial university of the Durban University of Technology is based on and consistent with many emerging principles and imperatives, as highlighted by the literature.

4.2   Nelson Mandela University

The following case study was constructed from the transcripts of the semi-structured interviews, supplemented by information obtained from the website of Nelson Mandela University.

Included in this case study are the results of the survey. Six respondents completed the survey and were interviewed: two deputy vice-chancellors; a dean; a head of school; a senior director; and a staff member working in entrepreneurship with students. This provided for varied and multiple perspectives from different portfolios and with different experiences within the university. Note that not all respondents shared all of the information reflected in the case study. To construct the case

study, the inputs have been aggregated and supplemented by information from the Nelson Mandela University website.

Nelson Mandela Metropolitan University opened on 1 January 2005, as a result of the merging of the PE Technikon, the University of Port Elizabeth and the Port Elizabeth campus of Vista University. In July 2017, Nelson Mandela Metropolitan University was renamed Nelson Mandela University. The name change provided an opportunity for the institution to rebrand and reposition itself continentally and globally, starting a new era towards a meaningful transformation. Nelson Mandela University has seven campuses with about 27,000 students enrolled in seven faculties: Humanities; Business and Economic Sciences; Education; Engineering, the Built Environment and Technology; Health Sciences; Law; and Science.

The university's strategy for the next decade is Vision 2030 (Nelson Mandela University, 2020a). The strategy was jointly created through extensive consultations with both internal and external partners. While entrepreneurship is not directly mentioned in the strategy, there are various indirect links and entrepreneurial elements related to an entrepreneurial university. Their vision of "a dynamic, African university recognized for its leadership in generating cutting-edge knowledge for a sustainable future" commits and focuses the utilization of the university's research and intellectual assets towards building sustainable futures. Innovation is listed as one of their strategic enablers. Their four strategic areas are: transformative engagement; humanizing innovative learning and teaching; meaningful research; and innovation and internationalization and inclusive student access for success. These areas further speak to the outcomes and impact focus elements that are the attributes of an entrepreneurial university. Their list of graduate attributes – creativity, innovation and entrepreneurial mindset – is clearly set out in the Annual Performance Plan 2021 of Nelson Mandela University (2020b).

4.2.1   Entrepreneurial developments

The following are developments shared by the respondents on the activities, milestones and decisions in various parts of the university that are facilitating progress in the transition to becoming an entrepreneurial university. There are three main imperatives driving entrepreneurship at the university: the commercialization of patents; student life and development linked to the teaching and learning portfolio; and the Strategic Resource Mobilization and Advancement Office.

4.2.1.1 Student entrepreneurship

A student entrepreneurship framework has been developed and approved, which serves to support student entrepreneurship opportunities at the university. In the policy, entrepreneurial skills are recognized as part of the vocational experience of a well-rounded graduate. The aims of the policy are: to create entrepreneurial skills for students; to regulate the entrepreneurial infrastructure spaces on campuses to ensure that sound governance is maintained; to provide mentorships and opportunities for students to experience the running of professional business entities; and to provide opportunities to create short-term employment that supports and enhances the livelihoods of students and enables student enterprises to thrive through a comprehensive support system (Nelson Mandela University, n.d.).

There are various initiatives and structures involved in delivering on this policy. At present, there is the Madibaz Youth Entrepreneurship Lab, which provides entrepreneurship support to students and has been developed to coordinate entrepreneurial activities for students, as well as serving as a point of contact. A partnership with the Small Enterprise Development Agency has been established to set up a new student incubator lab. Student societies that host various activities

encourage students to take up initiatives in entrepreneurship. Some of this support, which includes mentorship, is provided by external partners.

There is also a network of external entrepreneurs who come in to support and share their experiences with the students. However, there is a need for more engagement with business to support entrepreneurs within the system. There appears to be only a small amount of funding for student entrepreneurship.

There is a need for more maker spaces (there is presently one in existence) where students can practice their skills. This shortage is being addressed through the repurposing of existing spaces and the building of a second major maker space. There are some pieces in place, but this initiative requires further development and expansion.

An enabler and opportunity that should be explored for students is the formal co-curricular record. Students can develop a formal co-curricular record that they can access for their curricula vitae. A senior respondent suggested that this should be expanded to include entrepreneurship activities since they offer valuable experience to students, for example, in pitching to funders.

Entrepreneurship should be considered within the context of the fourth industrial revolution, preparing graduates for contexts that are constantly changing.

There are already many enterprises operating on campus, for example, running tuck shops, sewing and clothing alteration services, and producing hand sanitizer, among others. There is, however, still no full understanding of how to create an environment conducive to allowing student entrepreneurs to thrive. Even though there is a student entrepreneurship policy in place, no integrated policy framework provides end-to-end support for student entrepreneurs. There is a need for a well-developed system within the university that should align with the external entrepreneurship system, enabling transition pathways to allow student businesses on campus to transition to the external business environment.

Capacity-building training for certain staff members is being carried out through linkages with other universities running similar initiatives.

4.2.1.2   *Resource structures and initiatives*

Nelson Mandela University has established various departments, structures and companies as part of its resource strategy for financial sustainability, including support for entrepreneurship activities. Information on the structures, companies and initiatives were shared in the interviews as part of developing a sustainable financial strategy for the university.

The Strategic Resource Mobilization and Advancement Office was established in 2017 owing to the need for the university's medium- and long-term financial sustainability in resource mobilization, coordination and to ensure that resource mobilization initiatives were aligned to the university's development trajectory, mission and vision.

Its functions include planning, coordinating and reporting on strategic resource mobilization initiatives across the university. The Office also provides funding for strategic projects related to three nodes of activity: commercialization, institutional support, and strategic commercialization projects through the Nelson Mandela University Investment Company. The allocation of funding under all three nodes is done with consideration of how the funded initiatives support entrepreneurship. Students are also allowed to apply for some of the funding available under these three nodes. The

Strategic Resource Mobilization and Advancement Office is strategically located in the Office of the Vice-Chancellor, and, in addition to the listed functions, it provides logistical and administrative support to the Nelson Mandela University Trust and the Nelson Mandela University Investment Company.

Nelson Mandela University is the sole beneficiary of the Nelson Mandela University Trust, which is responsible for mobilizing resources for the university through donations in cash and kind, and managing the investment aspect of the Trust. The trustees of the Nelson Mandela University Trust established the Nelson Mandela University Investment Company in 2017.

The Nelson Mandela University Investment Company is a registered private company owned wholly by the Nelson Mandela University Trust. It was established to undertake certain strategic projects designed to improve the financial sustainability of the university. The Company was formed to initiate and manage strategic opportunities and commercialization projects without detracting from the academic activities or tax status of either the University or the Trust. The Nelson Mandela University Investment Company Board has members from both academia and the business sector.

The company pursues projects in property development, training, consultancy, advisory services and equity investments. The business model of the company creates value that can be utilized to support the mission of Nelson Mandela University.

Innovolve[12] is the commercialization company of Nelson Mandela University. Working closely with the university's Innovation Office, Innovolve, drives commercialization of the university's innovations through the licensing of intellectual property and the establishment of spin-out companies. The Innovation Office is focused on facilitating the identification, protection and management of intellectual property created through research. Another area of focus is harnessing this intellectual property for social and economic benefit. Innovolve holds shares in spinout and start-up companies that utilize the innovations of Nelson Mandela University. It also licenses the university's innovations to establish any new companies. Innovolve forms part of the innovation system in Nelson Mandela Bay through its involvement and ownership of Propella.

The Propella Business Incubator[13] provides support for innovators with disruptive technology, which gives manufacturing in the Eastern Cape and the rest of South Africa a competitive global advantage. Propella is a collaboration between Nelson Mandela University, the Industrial Development Corporation[14] and the private sector. The main areas of focus are on renewable energy, energy efficiency and related technologies, advanced manufacturing and supply chain optimization.

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[12] For more information on Innovolve, see: http://innovolve.co.za/.
[13] For more information on Propella, see: https://thepropella.co.za/.
[14] The Industrial Development Cooperation was set up by the Government to support, grow and finance businesses. The priorities of the Industrial Development Cooperation are aligned with the national policy direction, as set out in the National Development Plan, Industrial Policy Action Plan and industry master plans. Its mandate is to maximize development impact through job-rich industrialization, while contributing to an inclusive economy by, among other things, funding black-owned and empowered companies, black industrialists, women, and youth-owned and empowered enterprises (see: www.idc.co.za/about-us/.)

Nelson Mandela University uses some of their required spending on broad-based black economic empowerment[15] on Propella. Propella is about to launch a community entrepreneurial incubator with an international partner to support township businesses. Propella incubates Innovolve start-up companies based on the university's intellectual property, as well as external innovative companies.

A senior executive shared that Nelson Mandela University had a good track record in commercialization. However, there was a need to increase the university's capacities so as to commercialize more projects faster. There is a need for support for generating entrepreneurial ideas and a system to track and record commercialization possibilities. The tension of generating a third income stream should be balanced with the benefit for the public good.

The Strategic Resource Mobilization and Advancement Office is developing a framework to capacitate insourced workers to start businesses that can offer such services as catering, cleaning, garden services and conferencing to the university. This will create efficiencies, offer opportunities to the employees, and reduce salary costs.

The Strategic Resource Mobilization and Advancement Office is also working to develop a hotel that will be funded and owned by the Nelson Mandela University Investment Company, the plans for which are quite advanced and will provide a new era in commercial projects for the university.

Even with the Strategic Resource Mobilization and Advancement Office, some respondents shared that there was a need for sustainable resources for all entrepreneurship-related activities.

There was little or no dedicated budget for entrepreneurship activities. Funding is available when linked to innovation, engagement or research. As a result, some good ideas do not get implemented. One such idea was the utilization of accounting and auditing students and graduates to support auditors during the busy government financial year-end at the end of March. This would have added value for the auditors and allowed students to gain practical experience. However, this did not happen as it was a challenge to resource the project. One respondent saw the challenge as two-sided: one side involves to surface academics' creative ideas, and the second is to innovate to find sustainable resources to implement these ideas. One respondent suggested that there should be greater engagement with the private sector to unlock funding for entrepreneurship activities.

4.2.1.3   Leadership

All respondents indicated that there was a willingness and commitment from leadership towards building an entrepreneurial university. One of the senior respondents pointed out that the nuances and paradoxes of leadership need to be understood. Dealing with the current internal and external context of the university requires today's leaders to have multiple skills, for example, being tech-savvy, being able to serve others and being able to be effect transformations.[16]

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[15] Broad-based black economic empowerment is essentially a policy aimed at levelling the economic playing field that has been distorted by decades of apartheid economics during which black people were denied opportunities. Organizations are required to invest in initiatives, as stipulated under the policy (Labournet, 2020).

[16] A concept note was developed on the transitioning of African universities to become entrepreneurial universities entitled "Strengthening entrepreneurship and entrepreneurial universities in Africa: principals and deans thought

Combining research, innovation and internationalization under one deputy vice-chancellor portfolio speaks to entrepreneurial elements and allows each area to inform the others and relate to them in a focused way.

Engagement and social responsiveness appear to be part of all of the university's learning, teaching, research and innovation strategies, allowing it to function for the "public good".

The university views engagement as the "convergence" of the university and the community to create new knowledge and draw on the existing knowledge and insights of all of its communities and stakeholders. Engagement has been included in a deputy vice-chancellor portfolio and appears to be central to engagement with local stakeholders and constituents under the Vision 2030 plan.

There are various senior executive team members with accountability for the three main segments under which entrepreneurship has been planned. The challenge lies in the consolidation, coordination and operational implementation of these segments. There is a need for implementation imperatives to be in place.

4.2.1.4   *Teaching and learning*

Some qualifications have an entrepreneurial mindset course. There is also a marketing course that provides an entrepreneurial element through an experiential assignment, where students are given a small amount of money to start a business. For example, one group created a recipe book that they were able to sell. There is a need to embed entrepreneurship into all curricula across all faculties and disciplines at all levels.

There is no professor of entrepreneurship, but there are many academics whose work includes elements of entrepreneurship.

There is a need for new and relevant teaching and learning methods. This should include experiential e-learning that allows for skills development. There is also a need to reconsider the development of graduates in order to accommodate them in a changing workplace that requires different skills, in a world that, judging by the high unemployment rate, has become competitive for graduates.

One of the respondents saw self-transformation as a challenge. He further shared that universities are structured and controlled spaces that are usually not open to processes without a predetermined outcome. Staff are not taught to thrive in uncertainty. There was a need, therefore, for self-development in thinking and being entrepreneurial.

Academics should have an understanding and experience of being entrepreneurial before they teach entrepreneurship.

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leadership   training   session".   Available   at: www.ruforum.org/AGM2019/sites/default/files/Entrepreneurship%20Concept%20note.pdf.

4.2.1.5   Partnerships and engagement

There are presently partnerships with various African universities and other countries that have the potential for entrepreneurial partnering. One example that was shared involved partnerships with Germany and the United States on the work of Nelson Mandela University on renewable energy.

The university is expanding its external partnerships with both public and private organizations to offer consulting services. This creates opportunities for staff and students to have practical experience and an understanding of organizations, which can add content to the curriculum and generate third-stream income. The challenge here is in learning how to pitch the academic value proposition to private and public partners in practical terms.

An example of a public partnership is the university's engagement with the Office of the Mayor of Gqeberha (Port Elizabeth). The city needs assistance in crafting messages to the public on water conversation and the Nelson Mandela University Department of Arts will assist with the messaging, which provides an opportunity for an inclusive communication medium with a diverse public. The university has recently concluded a three-year partnership that includes funding with the Small Business Development Agency for an entrepreneurship incubator at Nelson Mandela University. The university is in talks with the Department of Small Business Development to explore support for wider entrepreneurship development. The Strategic Resource Mobilization and Advancement Office is in a partnership with the Eastern Cape on a provincial ocean economy strategy, for which funding has been secured. This will provide contract work for many people, including opportunities for Nelson Mandela University to sell its expertise, and for teaching and learning for academics and students.

Some faculties, such as those of Engineering and Law, have stronger partnerships with the private sector than other faculties. There is room for improvement in building partnerships consistently across the university. There is work being done with communities on sustainable food production.

There is also consideration and exploration of the use of internationalization beyond student exchanges to include research and commercialization and the need to explore partnerships with like-minded partners, including entrepreneurship practitioners.

4.2.1.6   Considerations and challenges

The following points are other issues that emerged from the interviews for consideration in relation to building an entrepreneurial university:

- The context of Nelson Mandela University, located in a "poor" province. Many students are unable to pay fees. Interventions and initiatives should be designed to be inclusive.

- While entrepreneurship activities are strong within individual silos, consolidation and coordination are critical. Success and lessons learned need to be shared across the university at the levels of both implementation and management.

- There is a need for an audit of the scope and range of entrepreneurship activities across campus, in formal programmes and co-curricular spaces.

- Impact measurement should have both an internal and external focus. Some of the required measures of impact are imperatives such as student service providers,

businesses that started on campus and now operate externally, the impact that graduates are making in society, contribution to the growth and development of the economy, and job creation.

- Measurement should be linked to agreed standards, targets and outcomes. Ultimately, the difference that Nelson Mandela University makes as an entrepreneurial university should be measured.

- There was a need for the right capacity in the right portfolios. Capacity-building should be linked to strategic implementation priorities to ensure that staff have the right skills to execute and implement priority initiatives. Capacity-building should include study tours.

- There should be platforms and spaces for sharing and learning with other universities.

- There should be reconsideration and development of new incentives, which need not always be monetary, for example, recognition of people's initiative and achievements, skills that can enrich staff profiles and curricula vitae, and allowing staff the space to explore and implement their creative ideas, travel and so on. The present incentive system for research is based on individuals, which is not consistent with current best practices that emphasize working in teams. This is relevant for Nelson Mandela University at a time when it is promoting an increase in transdisciplinary research. The performance management system should include incentives for entrepreneurship activities.

- Digitalization and technology should be enablers

- across all entrepreneurship initiatives for the university and for the enterprises that are started there.

- All entrepreneurship initiatives should also be aligned with the Vision 2030.

- There is the challenge of building buy-in for entrepreneurship across a vast university with approximately 30,000 students and 3,000 staff, as entrepreneurship is not considered by many to be a core part of the university's mandate. This will require a sustained communication plan of its own.

- There should be more exploration of collaboration and partnering with other universities in tender proposals and related activities. Universities have limited capacities, but collaboration can solve this issue. Nelson Mandela University has already achieved some success in this area. There is the potential to unlock government funding through universities working together.

- Benchmarking should be developed on the basis of the different characteristics of the HEInnovate[17] framework used for entrepreneurial universities in South Africa.

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[17] For additional information on HEInnovate, see: https://heinnovate.eu/en.; and: www.oecd.org/cfe/leed/heinnovate-skills-entrepreneurship.htm.

4.2.2 Survey results

As mentioned in the research methodology, the survey was based on and adapted from the framework for advancing entrepreneurial universities in Africa. The survey results cover findings on the seven attributes and the additional question 8 that covers the strategy and mission, support for entrepreneurial programmes, and budget and finance. The findings for the first seven attributes are illustrated with three-point graphs, which were consolidated from a seven-point Likert scale, as explained in the Research Methodology section. All six respondents completed the survey.

4.2.2.1   Leadership and governance

Figure 4.9
Nelson Mandela University – leadership and governance
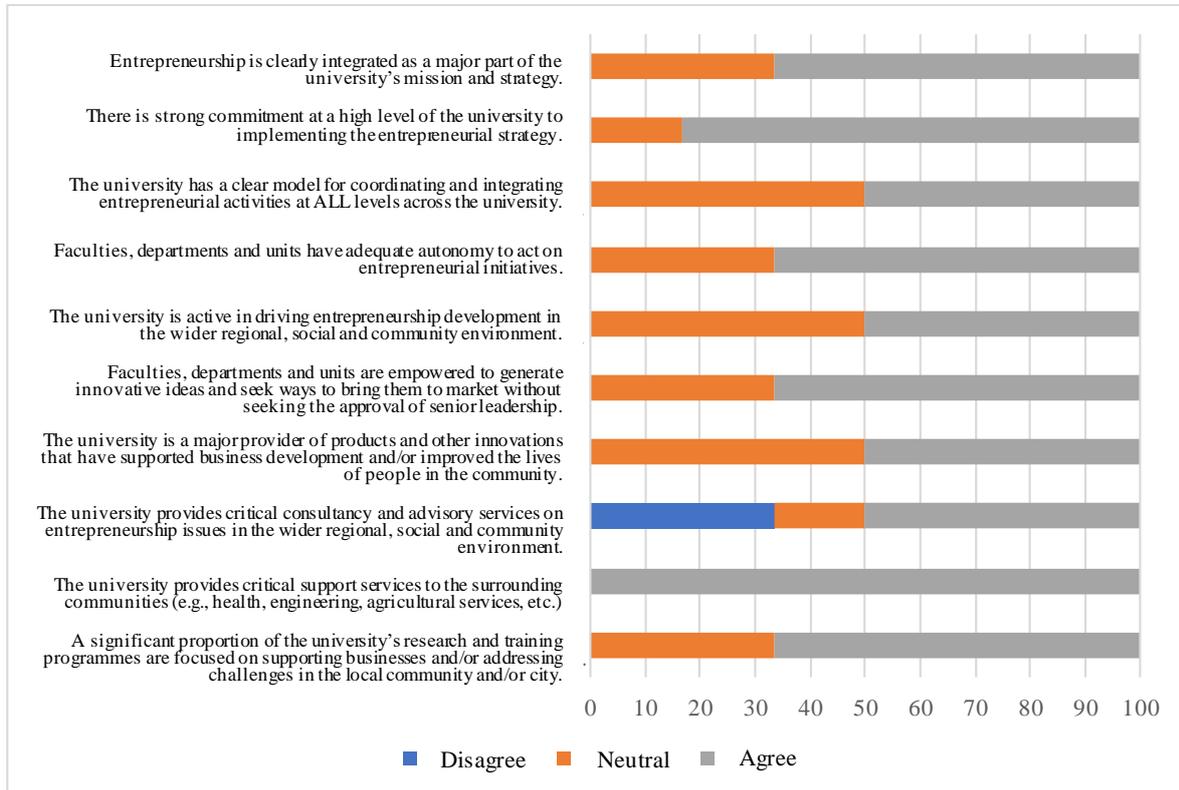
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

The lowest score was 50 per cent, with that amount of participants responding positively to the following statements:

- The university is active in driving entrepreneurship development in the wider regional, social and community environment.

- Departments are empowered to generate innovative ideas and seek ways to bring them to market without seeking approval of senior leadership.

- The university is a major provider of product and other innovations that have supported business development and/or improved the lives of people in the community.

- The university provides critical consultancy and advisory services on entrepreneurship issues in the wider regional, social and community environment.

However, 100 per cent of respondents indicated that the university provides critical support services to the surrounding communities (e.g., health, engineering, agricultural services), with the rest of the scores indicating a rate of 66 per cent and above agreement on the university's activities.

4.2.2.2   Organizational capacity, people and incentives

- 83.4 per cent of respondents were neutral on interdisciplinary research and entrepreneurship support groups being prioritized in the university system.

- 66 per cent agreed that the university is open to recruiting and engaging with individuals who have entrepreneurial attitudes, behaviours and experience.

- 66 per cent disagreed that involvement in entrepreneurial activities is included as a key criterion in the performance review and promotion of staff.

There were split opinions on:

- Whether there were mechanisms in place for breaking down traditional boundaries and fostering new relationships by bringing internal stakeholders together (staff and students) and whether mechanisms for building synergies between them are adequate. Overall, 50 per cent agreed with this statement and 50 per cent were neutral.

- Staff that support entrepreneurial activities are provided with adequate additional budget, space and time (e.g., reduced teaching load). In total, 50 per cent disagreed and 50 per cent were neutral.

- The university has a sustainable financial strategy in place to support entrepreneurial development. Overall, 50 per cent agreed, 33 per cent were neutral and 16 per cent disagreed.

- The university's entrepreneurial objectives are supported by a wide variety of funding sources/investment, including investment by external stakeholders. For this statement, 50 per cent agreed, 33 per cent were neutral and 16 per cent disagreed.

- There is adequate status and recognition given to other stakeholders who contribute to the university's entrepreneurial agenda. In total, 50 per cent were neutral, 33 per cent disagreed and 16 per cent agreed.

- The university's investment in staff development to support its entrepreneurial agenda. Here, 50 per cent were neutral, 33 per cent agreed and 16 per cent disagreed.

- There are clear incentives and rewards for staff who actively support the university's entrepreneurial agenda. Overall, 50 per cent were neutral and 50 per cent disagreed.

Figure 4.10
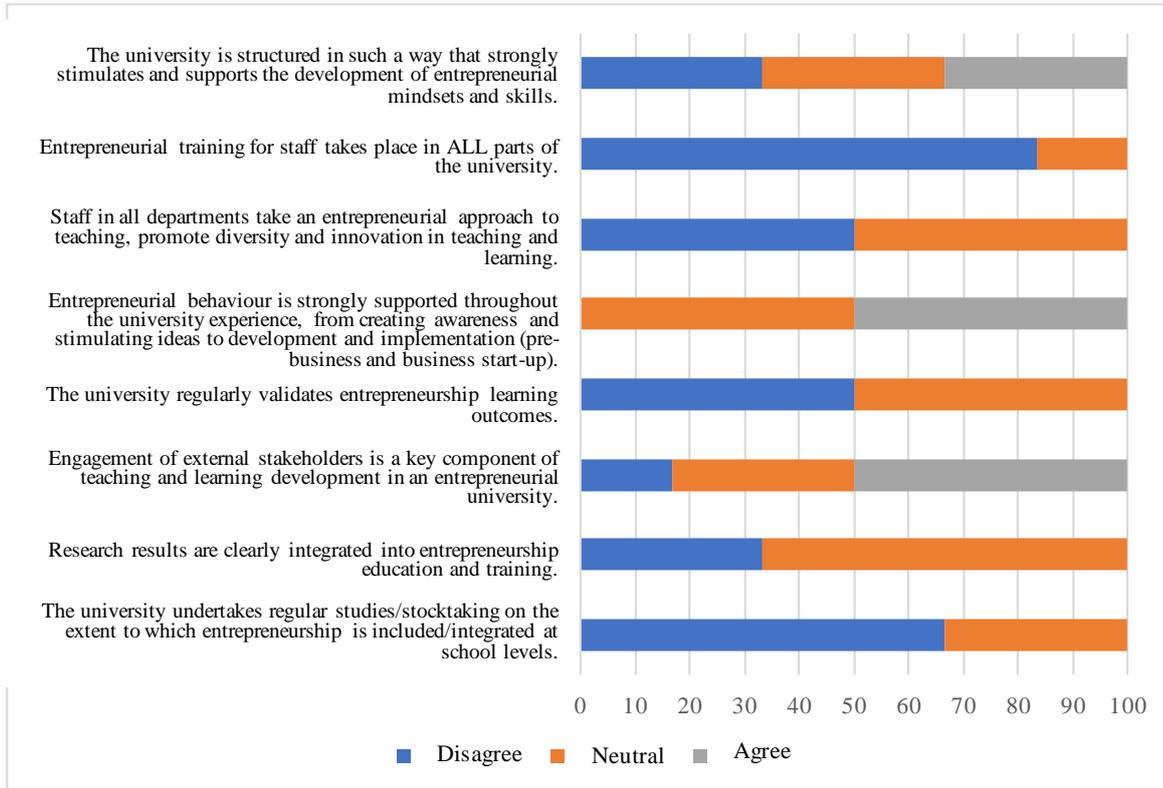**Nelson Mandela University – organizational capacity, people and incentives**
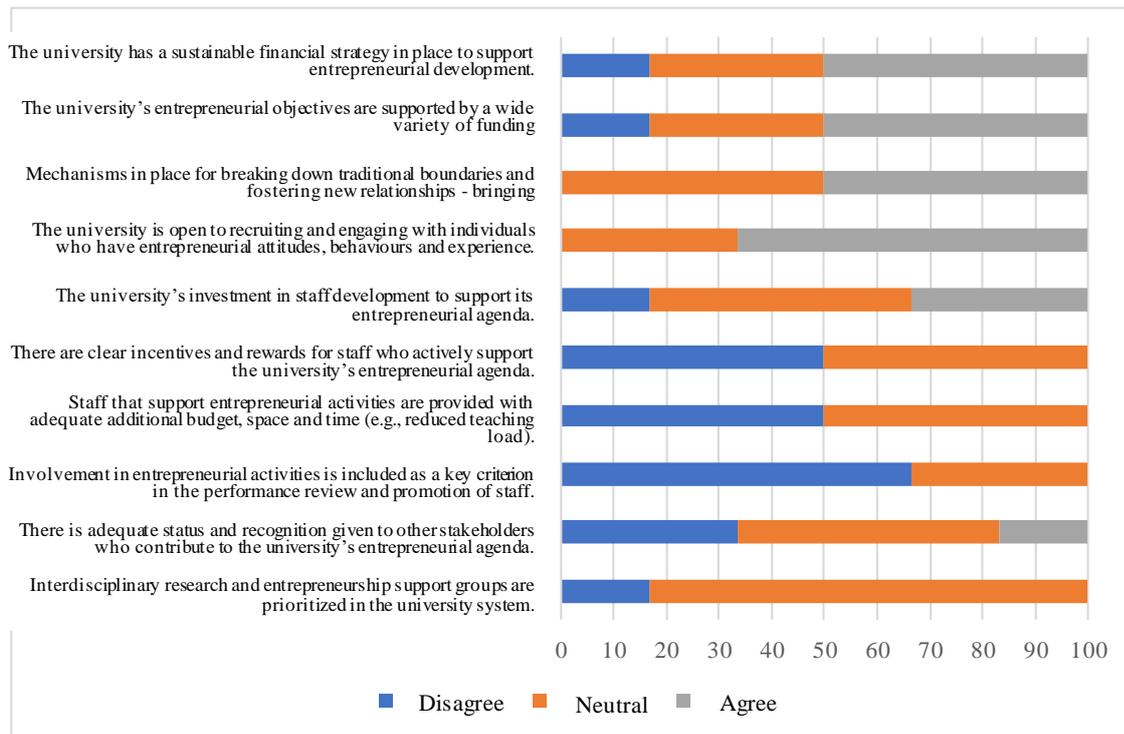
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.3   *Teaching and learning development*

- There was 80 per cent disagreement that entrepreneurial training for staff takes place in ALL parts of the university.

- 70 per cent disagreed that the university undertakes regular studies/stocktaking on the extent to which entrepreneurship is included/integrated at school levels.

- 70 per cent were neutral on the statement that research results are clearly integrated into entrepreneurship education and training.

- Results for the statement that the university regularly validates entrepreneurship learning outcomes and that staff in all departments take an entrepreneurial approach to teaching, promoting diversity and innovation in teaching and learning were split, with 50 per cent of respondents neutral and 50 per cent disagreeing.

- The statement that entrepreneurial behaviour is strongly supported throughout the university experience, from creating awareness and stimulating ideas through to development and implementation (pre-business and business start-up) also has a split score, with 50 per cent agreeing and 50 per cent neutral.

- The statement that the engagement of external stakeholders is a key component of teaching and learning development in an entrepreneurial university received a response of 50 per cent agreement, 30 per cent neutrality and 20 per cent disagreement.

- 33 per cent of respondents agreed, 33 per cent disagreed and 30 per cent were neutral on whether the university is structured in such a way that strongly stimulates and supports the development of entrepreneurial mindsets and skills.

Figure 4.11
Nelson Mandela University – entrepreneurship development in learning and teaching

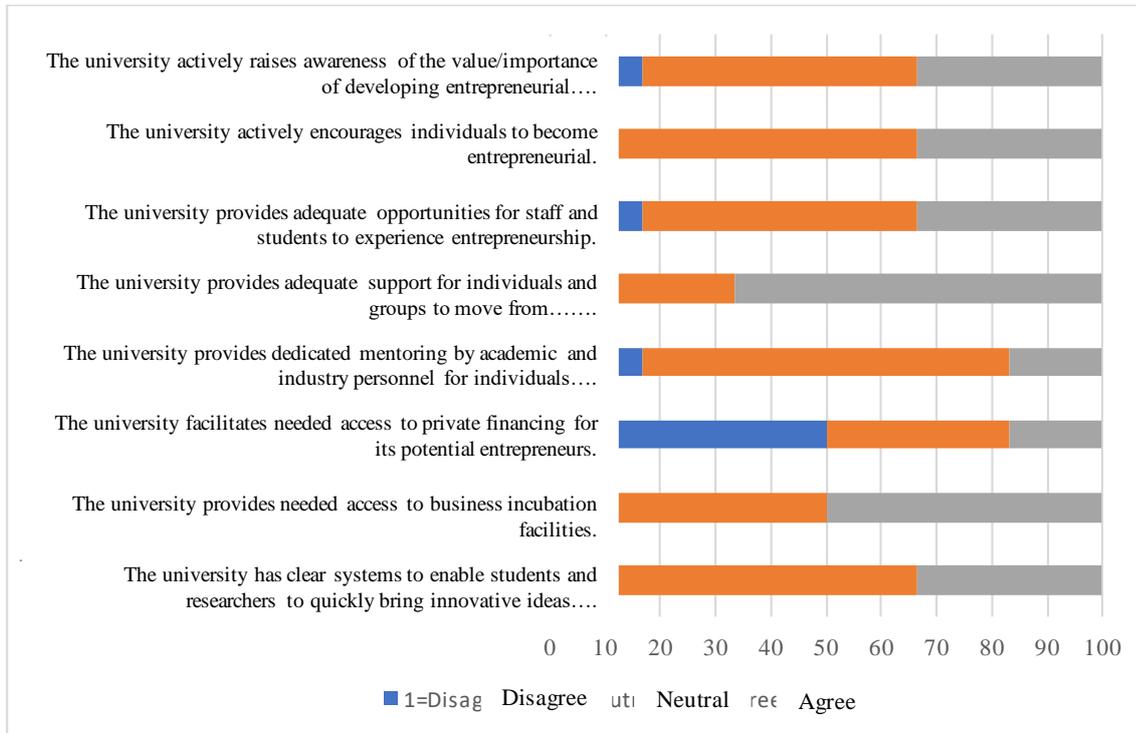*Source:* United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.4 Pathways for entrepreneurs

- 66 per cent of responders were neutral on whether the university actively encourages individuals to become entrepreneurial, has clear systems to enable students and researchers to quickly bring innovative ideas and businesses with minimal regulations, and provides dedicated mentoring by academic and industry personnel for individuals who wish to become entrepreneurial.

- 66 per cent agreed that the university provides adequate support for individuals and groups to transform entrepreneurial ideas into action.

- 50 per cent disagreed that the university facilitates the necessary access to private financing for its potential entrepreneurs.

- 50 per cent agreed and 50 per cent were neutral as to whether the university provides the necessary access to business incubation facilities.

- 33 per cent of respondents agreed and 50 per cent were neutral as to whether the university actively raises awareness of the value/importance of developing entrepreneurial abilities among its staff and students.

- 50 per cent were neutral and 33 per cent agreed that the university provides adequate opportunities for staff and students to experience entrepreneurship.

Figure 4.12
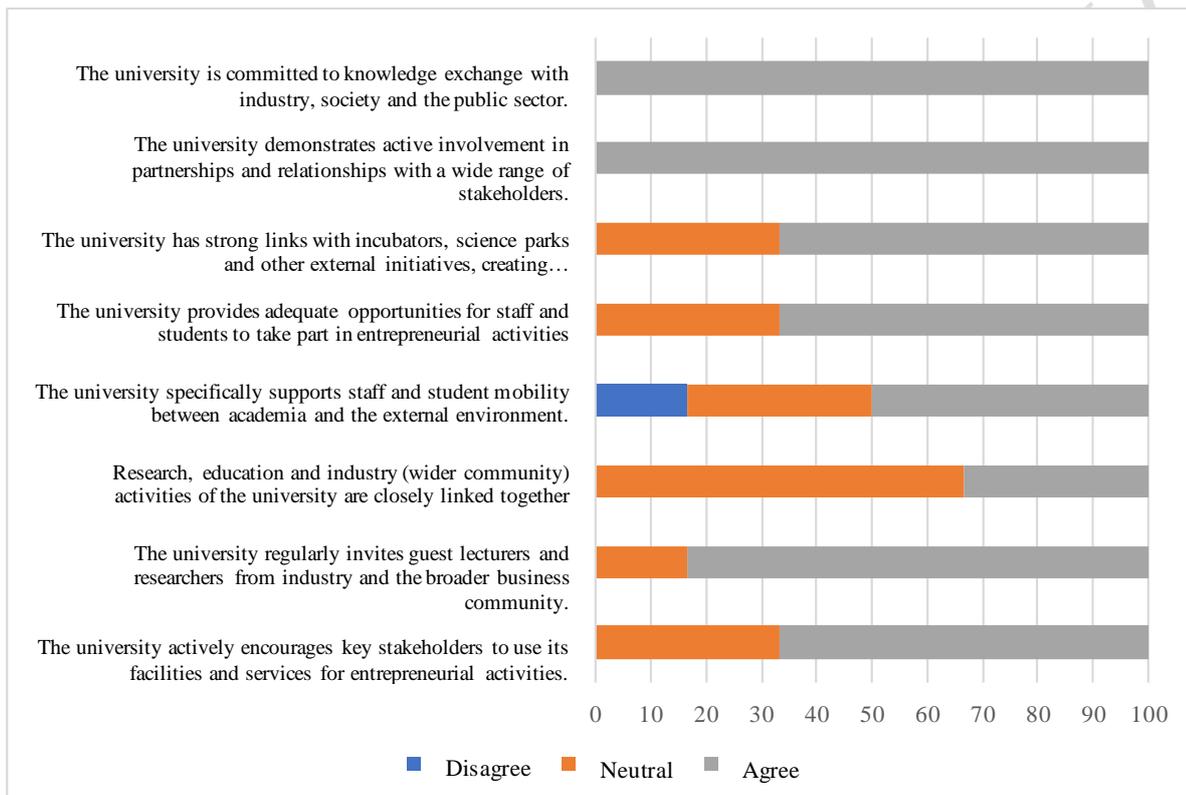**Nelson Mandela University – pathways for entrepreneurs**

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.5 *Business and external relationships for knowledge exchange*

- There was 100 per cent agreement on whether the university is committed to knowledge exchange with industry, society and the public sector, and whether the university demonstrates active involvement in partnerships and relationships with a wide range of stakeholders.

- 83 per cent agreed that the university regularly invites guest lecturers and researchers from industry and the business community at large.

- 66 per cent agreed that the university has strong links with incubators, science parks and other external initiatives, creating opportunities for dynamic knowledge exchange, and that the university actively encourages key stakeholders to use its facilities and services for entrepreneurial activities.

- 66 per cent were neutral on whether research, education and industry (the wider community) activities of the university are closely linked in a way that affects the whole knowledge system.

- There was a 50 per cent split response between those who agreed and those who were neutral on whether the university provides adequate opportunities for staff and students to take part in entrepreneurial activities with business/the external environment.

- 50 per cent of respondents agreed and 33 per cent were neutral that the university specifically supports staff and student mobility between academia and the external environment.

Figure 4.13

Nelson Mandela University – university-business/external relationships for knowledge exchange

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.6   *The entrepreneurial university as an international institution*

- There was 100 per cent agreement that the university and its departments and faculties actively participate in international networks.

- 83 per cent agreed that the university explicitly supports the international mobility of its staff and students (including PhD students).

- 83 per cent were neutral as to whether the university actively seeks and attracts international and entrepreneurial staff (including teaching, research and PhDs).

- 66 per cent were neutral on whether internationalization is a key part of the university's entrepreneurial strategy.

- 50 per cent agreed and 50 per cent were neutral on whether the university clearly demonstrates internationalization in its approach to teaching.

Figure 4.14
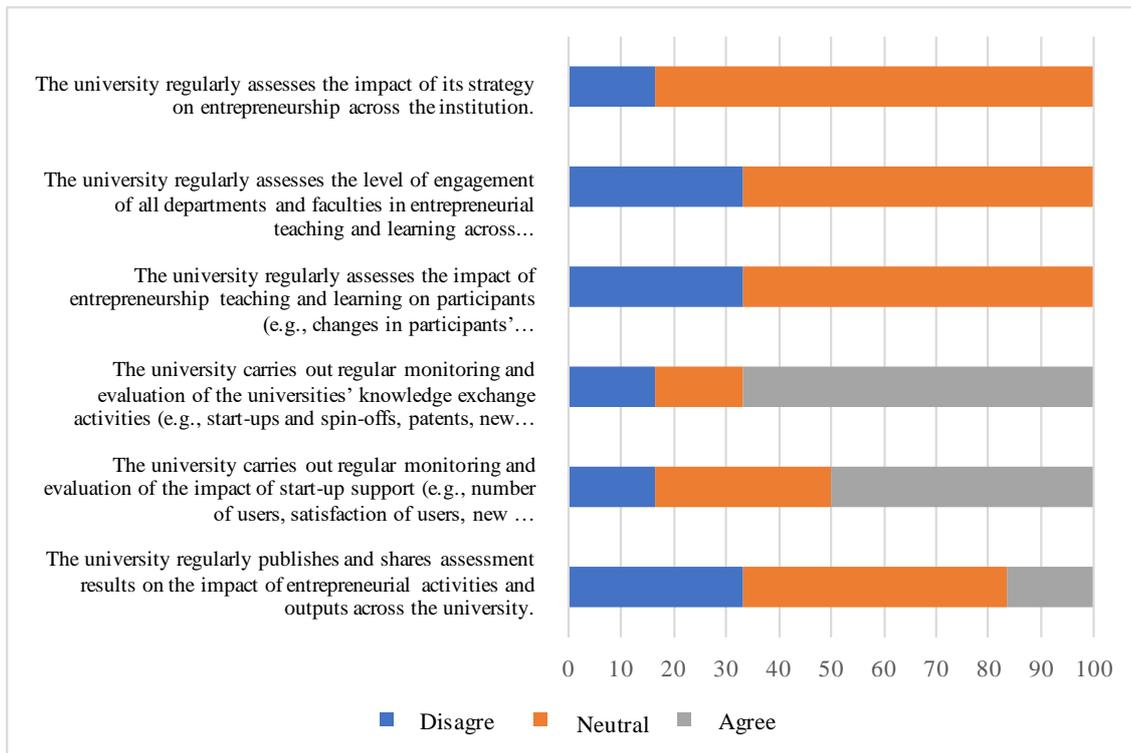**Nelson Mandela University – the entrepreneurial university as an international institution**
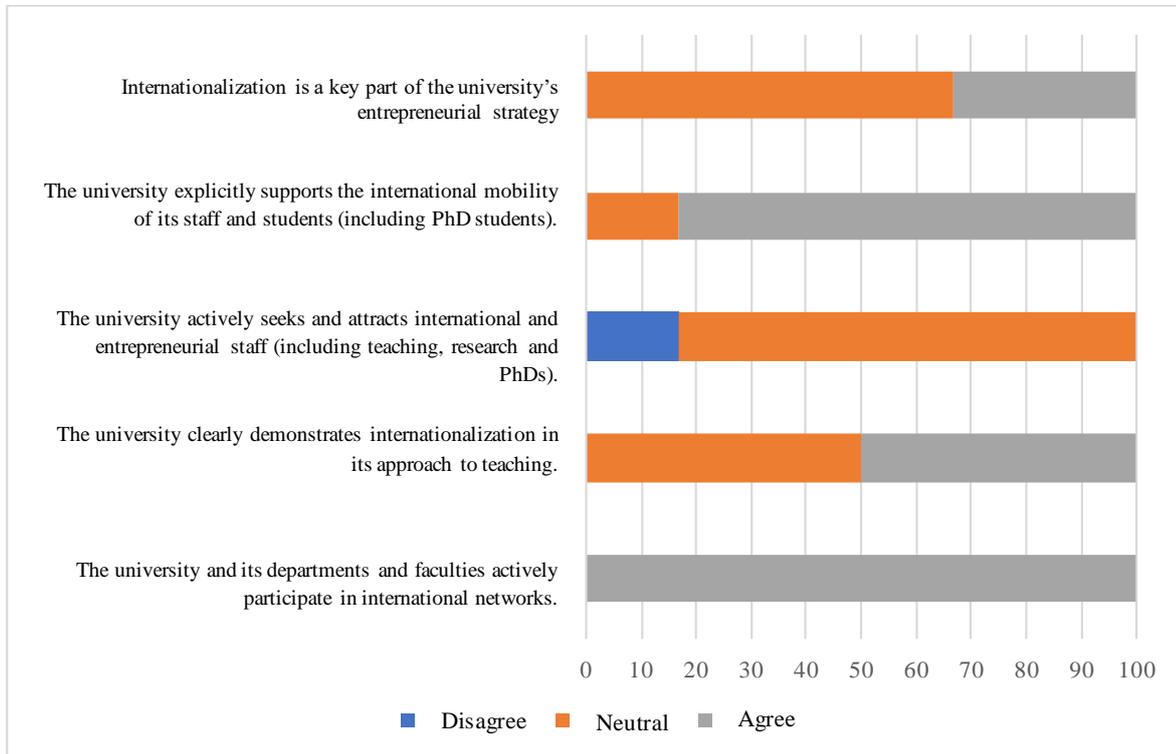
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.7 *Measuring the impact of an entrepreneurial university*

- 66 per cent of respondents agreed that the university carries out regular monitoring and evaluation of the university's knowledge exchange activities (e.g., start-ups and spin-offs, patents, new research ideas and new partnerships).

- 50 per cent agreed that the university carries out regular monitoring and evaluation of the impact of start-up support (e.g., number of users, satisfaction of the users, new support introduced, number of start-up ideas realized).

- 83 per cent were neutral on whether the university regularly assesses the impact of its strategy on entrepreneurship across the institution.

- 66 per cent were neutral on both whether there was a regular assessment of the impact of entrepreneurship teaching and learning on participants (e.g., changes in participants' motivation to undertake entrepreneurial activities, the level of competence in the skills gained) and whether the university regularly assesses the level of engagement of all departments and faculties in entrepreneurial teaching and learning across the institution.

- 50 per cent were neutral, and 33 per cent disagreed on whether the university regularly publishes and shares the results of assessments of the impact of entrepreneurial activities and outputs across the university.

Figure 4.15
Nelson Mandela University – measuring the impact of the entrepreneurial university
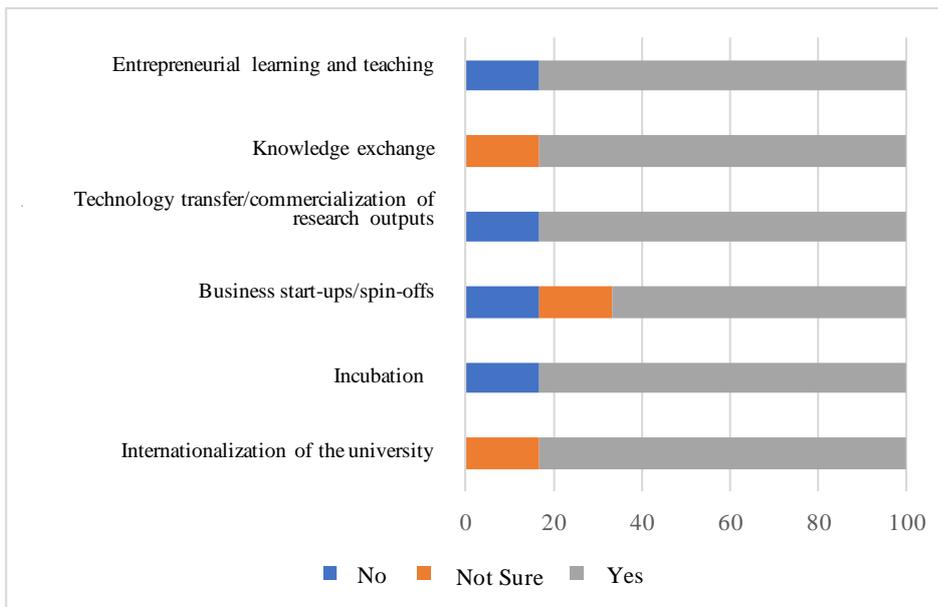

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.8   Do these areas have a specific implementation plan?

There was 83 per cent agreement that all of the areas had a specific implementation plan, except for business start-ups and spin-offs, which received 66 per cent agreement.

Figure 4.16
Nelson Mandela University – university mission and strategy

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.9   Availability of entrepreneurship support structure, services and programmes

The survey responses were varied and ranged from 33 per cent agreement to 100 per cent agreement. There was 100 per cent agreement with the statement that there is a unit/team to liaise and manage external relationships with international partners and associates. Some of these responses were not consistent with the results of the interviews, while some were consistent.

Table 4.4
Availability of entrepreneurship support structures, services and programmes: Nelson Mandela University
(Percentage)

Availability of entrepreneurship support structure, services and programmes	*Yes*	*No*	*Not sure*
a. A central unit/team designated to coordinate entrepreneurial activities across the university.	66.6	33.3	
b. A high-level leadership position (e.g., dean/director/chair of Entrepreneurship) assigned to oversee the implementation of the university's entrepreneurial strategy.	66.6	16.6	16.6
c. Almost all schools/faculties host a specialized team/unit/centre to coordinate entrepreneurial activities (e.g., technology transfer office, knowledge exchange centre, industry liaison unit, student enterprise development support unit).	33.3	16.6	50
d. A designated unit/team (e.g., alumni office and/or international office) to liaison and manage external relationships with international partners and associates.	100		

e.	A designated unit/team to manage intellectual property issues (e.g., patents, non-disclosure agreements, other contractual agreements) of internal knowledge and innovations produced.	83.3		16.3
f.	A central quality assurance unit/team to review the quality of entrepreneurial activities of the university.	33.3	16.6	50
g.	Shared facilities for research and teaching across faculties and schools for exploiting internal knowledge.	33.3	16.6	50
h.	Programmes/initiatives to bring successful private sector-based innovators and entrepreneurs to become involved in/support teaching and research.	50	16.6	33.3
i.	Seasoned and respected business leader(s) that serve as entrepreneurs-in-residence.	33.3	16.6	50
j.	Extracurricular and/or non-credit activities and events on entrepreneurship topics delivered by entrepreneurs and business practitioners.	83.3		16.6
k.	Staff development programmes focusing on entrepreneurial skills, knowledge and techniques for learning and teaching.	16.6		83.3
l.	Incentive programmes in place to recognize and/or award (e.g., cash prizes, awards, certificates, paid study and development leave) successful entrepreneurial initiatives by staff and students.	33.3	33.3	33.3
m.	Recognition and award for outstanding external stakeholders, partners and/or alumni who are actively engaged in and/or contribute to entrepreneurship promotion.	33.3	33.3	33.3
n.	An external panel of private actors (e.g., entrepreneurs, business experts) to review and comment on entrepreneurship-related programmes and courses.		50	50
o.	New entrepreneurship-related programmes and courses introduced in the last three years across the university.	50	16.3	33.3
p.	Student international mobility programmes (e.g., international exchange, internship and/or volunteering programmes).	50		50
q.	Staff international mobility programmes (e.g., international visiting scholarships, secondment to foreign institutions).	50		50
r.	Joint degree and/or research programmes with international partners.	50		50
s.	Joint research centres with international partners.	66.3		33.3
t.	Designated channels (e.g., agents, offices) to recruit international staff and students.	33.3	16.6	50
u.	Designated public channels (e.g., printed or online) to disseminate entrepreneurship-related information (e.g., events, outputs, impacts) about the university.	33.3	50	16.6

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.2.10   Budgeting and financing

Again, the responses were varied, as shown in table 4.5.

Table 4.5
Budgeting and finance: **Nelson Mandela University**
(Percentage)

	Budgeting and financing	Yes, it has grown	No, it has not grown	Not sure/no information	No separate budget
a.	(Direct) entrepreneurial activities	50	16.6	16.6	16.6
b.	Entrepreneurial support services/activities	100			
c.	Internationalization activities	16.6	16.6	50	16.6
d.	Knowledge exchange and engagement activities with external parties	50		33.3	16.3
e.	Staff training and development focusing on entrepreneurial knowledge and skills		16.6	66.6	16.6
f.	Reinvestment of entrepreneurial incomes of the university		16.6	83.3	
g.	Domestic public funding	50		50	
h.	Domestic private funding	33.3		66.6	
i.	Foreign public funding	16.6		83.3	
j.	Foreign private funding			100	

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.2.3 Definition of an entrepreneurial university

The respondents offered varying perspectives on the notion and definition of an entrepreneurial university. The following are some of the remarks made in response to this question:

- An entrepreneurial university cultivates an entrepreneurial mindset in students. It produces graduates who are innovative and creative, embraces challenges and wants to break new ground. It develops the capacities of students so that they can navigate change throughout their lives.

- It promotes student entrepreneurship to contribute to the economy.

- It commercializes research, knowledge outputs and intellectual property to contribute to third-stream income, and community incubators. It utilizes assets or academic services for resource mobilization for the university.

- Each university should focus on what they think is a priority and important for them.

- Research and intellectual property should have a positive impact on communities and society.

- An entrepreneurial university is on the cutting edge of innovation and converting them into products.

- It works in the space between the formal and informal economy.

- There is a need to rethink the provision and purpose of education, in a change from the traditional model.

4.2.4 Conclusion (Nelson Mandela University)

The results indicate that Nelson Mandela University has taken various decisions, embarked on various initiatives and hosted activities that contribute to becoming an entrepreneurial university. Some of these are planned under an entrepreneurship framework, while others have been developed through other imperatives. What is clear is that the university's leadership is committed to the idea of being an entrepreneurial university, that there are strategic and implementation initiatives in place, and that continued consideration is being given to this commitment.

The respondents offered varied opinions on the definition of an entrepreneurial university. The understanding and definition relate to what the university does, and its impact as stated under section 5 above. What emerged from the inputs is that the work of an entrepreneurial university should have a positive impact on society, that graduates should be developed with a set of qualities that enable them to impact society, and that the intellectual property of the university should be commercialized for both third-stream income and the betterment of society.

The strategic plan of Nelson Mandela University, Vision 2030, has various entrepreneurial elements in its vision, mission, strategic focus areas, strategic enablers, values and graduate attributes. The interviews, desktop research and survey indicate the commitment of the university to adding value to society and the province through engagement with its constituents and stakeholders. Engagement appears to be a strong imperative in its consideration of its external impact and it work for the public good. The survey results also strongly indicate the inclusion of entrepreneurial imperatives in the university's mission and strategy, namely: business incubators; start-ups; entrepreneurial teaching and learning; internationalization; knowledge exchange; and technology transfer.

Entrepreneurship is unfolding in three main nodes: the Deputy Vice-Chancellor: Research, Innovation and Internationalization; the Strategic Resource Mobilization and Advancement Office; and the Dean of Students. Commercialization takes place at the institutional level (staff and students), and through the strategic commercial initiatives of the Office. There are plans being implemented and new plans being developed. Responsibility therefore lies with various portfolios.

A policy framework for student entrepreneurship that will guide the entrepreneurship development of students has been developed and approved. Nelson Mandela University has finance

initiatives, technology transfers, incubators and an entrepreneurial hub in place in its initial phase for supporting entrepreneurship. There are plans to expand all of these.

The survey results revealed certain contradictions in some areas, and on many attributes, respondents were neutral or did not know. This is also indicative of the fact that activities unfold within silos and that not all staff members are aware of all the information and developments related to entrepreneurship.

4.3 Stellenbosch University

4.3.1 Entrepreneurial developments

The following case study was constructed from the transcripts of the semi-structured interviews, supplemented by information obtained from the university's website. Included in the case study are the results of the survey. Five respondents completed the survey and were interviewed, namely: a deputy vice-chancellor; a professor; a senior researcher; the Chief Executive Officer of a spin-off company; and the Director of the incubator.

This provided for varied and multiple perspectives from different portfolios and with different experiences within the university. Note that not all the respondents shared all of the information reflected in the case study. The inputs have been aggregated and supplemented by information from the university website to construct the case study.

Stellenbosch University has approximately 29,000 students and 3,000 permanent staff members, spread between ten faculties on five campuses. The faculties are: Agrisciences; Economic and Management Sciences; Medicine and Health Sciences; Engineering; Military Sciences; Arts and Social Sciences; Science; Education; Law; and Theology. Stellenbosch University is considered a leading South African university based on its research output, student pass rates and rated scientists. The university also aims to deliver engaged citizens and responsible leaders who are willing to use their expertise and skills to serve society.

Stellenbosch University embarked on the process of crafting its Vision 2040 in July 2016. Vision 2040 reflects the institution's strategic choices and aspirations, specifically that "Stellenbosch University will be Africa's leading research-intensive university, globally recognized as excellent, inclusive and innovative, where we advance knowledge in service of society." There is a five-year strategic framework in pursuit of Vision 2040.[18]

The strategic themes can be considered elements of an entrepreneurial university, and their strategic framework document uses language to this effect in terms of its impact, student experiences, culture and partnerships. Stellenbosch University also clearly commits to building eight key attributes, five of which are characteristic of an entrepreneurial university:

- All-encompassing impact

- Agile, adaptable and responsive

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[18] Additional information on the Stellenbosch University Vision 2040 and the Strategic Framework 2019-2024, is available at: www.sun.ac.za/english/Documents/Strategic_docs/2018/Vision-2040-Strategic-Framework-2019-2024.pdf.

- Collaborative nature and approach

- Systemic sustainability

- Entrepreneurial mindset

4.3.2   Entrepreneurship initiatives

The respondents shared input on the various decisions, activities, developments and plans of Stellenbosch University aimed at becoming an entrepreneurial university. The dominant imperative at the university appears to be a focus on protecting, patenting, and commercialization its intellectual property. The following cover a thematic grouping of the input from the respondents on entrepreneurship endeavours at Stellenbosch University.

4.3.2.1   Leadership

Leadership was seen as an important and critical element of an entrepreneurial university. Some reasons for this were that leadership at the highest level allows for influencing, developing, directing, and leading, and gives the project the gravitas needed to drive and implement change and initiatives. At this senior level, a leadership position also allows for authority and access to all parts of the university, thus enabling connections between the various components of the internal entrepreneurial system. One respondent shared that it was important for leadership to reside in an academic role to ensure the status, credibility and buy-in from other academics. The right leader should meet stringent academic requirements and commitments, and understand the importance of entrepreneurial thinking, intellectual property and business.

At Stellenbosch University, ownership and accountability are located at the senior executive management level with the Deputy Vice-Chancellor: Research, Innovation and Postgraduate Studies. Some respondents attributed the university's current successes to the Deputy Vice-Chancellor, who is an innovative, adaptable and open leader. The Deputy Vice-Chancellor himself attributes the successes to the entrepreneurial culture of the university. Leadership at Stellenbosch University has been important for generating, driving and implementing entrepreneurship initiatives. The university's leadership is committed to its Vision and remains focused on its aims of commercialization, building resources and developing capacities. The newly appointed Deputy Vice-Chancellor for Teaching and Learning has made a commitment to increasing entrepreneurship at Stellenbosch University. All respondents were aware of the university's leadership, support, buy-in, and commitment to commercialization and the development of entrepreneurial elements within the university.

4.3.2.2   Capacity

All respondents agreed that capacity-building is a key feature in the creation of an entrepreneurial university. Capacity should be understood in terms of the various roles in which it is required. One example is the range of skills required for the commercialization process, namely, identifying the potential for a patent; registering a patent; acquiring a champion; prototyping a product; developing a business plan; providing support through all start-up processes and phases; and taking the product to market. While these capacities are presently available, Stellenbosch University will need to develop far greater capacities in the right positions to scale up. One respondent's opinion was that the commercialization value chain starts with research. Academics need to be trained on how to identify potential intellectual property before they publish. Stellenbosch University has a technology fund that supports capacity-building of this kind.

Capacity-building is required to implement the plans for continued entrepreneurship development at Stellenbosch University. An example is the development of a programme for undergraduates. This will require increased capacities, expertise, time and financial investment to design, develop and deliver the programme.

4.3.2.3   *Teaching and learning*

There are entrepreneurship courses in some faculties and departments, such as those in the Faculty of Economic and Management Sciences and the Business School. These should be expanded to all faculties as all students need practical, business and entrepreneurial skills. Graduates should learn how to make a difference in the world. There are discussions on developing a general course for all undergraduates that would aim to instil an entrepreneurial mindset. A challenge to including such a course lies in changing the mindsets of some academics and enabling student entrepreneurship.

At present, the Business Studies and Engineering schools offer students the option of studying one module abroad. There is consideration of expanding this programme to the Science Faculty. One respondent thought that multidisciplinary and transdisciplinary learning and programmes were important, even within the same faculty. For example, being able to choose both chemistry and physiology in the same faculty.

LaunchLab[19] (Stellenbosch University's incubator) hosts an annual competition for students, usually on a specific theme or topic. This encourages students to think about new ideas that could be converted into businesses. The successes of this competition are shared across the university, as they generally represent practical ways to make a difference or solve local problems. LaunchLab also hosts a credit-bearing holiday programme for students.

There is also some focus on social entrepreneurship. For the last 18 years, Stellenbosch University has hosted an annual Word Festival that attracts about 120,000 people to Stellenbosch over a week. The Festival has various art performances, with leading artists from all over South Africa. This provides a huge contribution to the economy of Stellenbosch. It creates jobs for the organizers, temporary work during the Festival, and opportunities for the artists themselves.

Stellenbosch University was quick to adapt to online teaching and learning largely because of the entrepreneurial spirit of the institution. While the new hybrid model of teaching and learning broadens access across the continent, the effects on students of the present status quo of increased screen time is yet unknown. There is a need for more project-based learning.

Some departments, like Food Sciences, are doing well in finding opportunities for students to engage with and learn from industry before they graduate. This has also increased their employment opportunities.

One respondent shared that one of the challenges for entrepreneurship at the university level is that children are born with creativity, but the school system is not designed to support their creative development. Most students lose touch with their creativity before they come to university. Universities are expected to make up for this and restore creativity.

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[19] Additional information on LaunchLab is available at: https://launchlab.co.za.

4.3.2.4   Internationalization, collaboration and partnerships

While internationalization and partnerships do not appear consistently across all faculties and departments, Stellenbosch University has some excellent international and collaborative initiatives. One respondent cited the example of their partnership with Fraunhofer in Germany, which is the largest applied research platform in the European Union. The work on the platform is largely focused on developing technology solutions and building businesses across Africa. The challenge is in adapting solutions for Africa. This platform also presents an opportunity for the university to spread its intellectual property throughout Africa.

Internationalization adds value in building an entrepreneurial university. Stellenbosch University has been collaborating with Coventry University in the United Kingdom and has learned much in terms of how Coventry University is structured, drives innovation, and delivers value in its entrepreneurship endeavours.

Stellenbosch University recently launched the Centre of Excellence in Scientometrics and Science, Technology and Innovation Policy, together with the African Union Development Agency. Besides the opportunity this presents for the university, this has energized researchers to connect at the highest level with every country in Africa to enable them to add value through their intellectual property and innovation.

Local and international partners are critical to collaborations and the system. However, there is a need to continuously search for suitable partners. Some departments have collaborations with municipalities.

The university also engages leading entrepreneurs from Stellenbosch to support entrepreneurship efforts, some of whom are founders of big businesses. They are engaged in various supporting and operational roles, for example: acting as directors of boards of some spin-off companies or as investors; supporting the development of ideas; or providing expertise in setting up a business, mentoring and beyond. The value for the investor is that they have first sight of the inventions and ideas that are being generated at Stellenbosch University. A particular skill is to learn how to create and sell shares, and how to create value out of virtually nothing. An example of this is one of the spin-off companies, which was transformed from a R13 million investment to a company worth R200 million without selling a single product. This success was the result of selling the value proposition of the company, a very specific skill that most academics do not possess.

Stellenbosch University is also part of the Cape Higher Education Consortium, which is aimed at establishing the Western Cape as a strong higher education region.[20] The Consortium is comprised of the four public universities in the Western Cape: the University of Cape Town; the University of the Western Cape; Cape Peninsular University of Technology; and Stellenbosch University. The University of South Africa holds observer status at Consortium Board meetings and is included in activities where possible. The Cape Higher Education Consortium is registered as a not-for-profit company with a small staff complement. Staff from the four institutions resource and provide expertise for projects, with consultants and expertise being contracted when required. The Consortium incorporates several projects, communities of practice and a management development programme. It mainly covers issues that affect all of its members. The Cape Higher Education Consortium has a growing interest in triple helix relationships (academia, government and business)

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[20] For more information on the Cape Higher Education Consortium, see: www.chec.ac.za/.

and the role of higher education in regional development. It has also been drawn into various initiatives to promote innovation in the region.

4.3.2.5   *Incentives*

One respondent shared their view that entrepreneurship should be included in the key performance indicators of departments and staff. The present system does not incentivize any interest in entrepreneurship activities. Another respondent felt that the possibility of earning royalties for research is inspiring.

There is a policy on shared intellectual property for inventors, under which 33 per cent of the turnover goes to the university's central budget, 33 per cent goes to the department and 33 per cent goes to the inventor. The university carries the risk, covers the patenting costs and provides the required end-to-end commercialization support. There are already success stories of academics who have become millionaires because of their intellectual property. One respondent considered the revenue share model to be an incentive.

4.3.2.6   *Research*

Stellenbosch University pursues relevant and required applied research for industry that generates an average revenue of about R1.2 billion per annum. This research then brings value to industry in the form of patents and products. State funding covers very specific kinds of research that does not stimulate entrepreneurship. This kind of focus in industry research demands a system of its own and requires highly-rated researchers, world class facilities and research support. Without this system, it becomes challenging to generate original ideas, research and concepts, or to develop original products and processes.

Stellenbosch University also undertakes research that contributes to positive social developments, and it makes social impact funds available for such projects. One such endeavour is an aquaponics project that will provide support for the Heartlands Baby Sanctuary in Somerset West. This will add value for Heartlands and create opportunities for students to learn skills and apply the knowledge they acquire in their future careers.

4.3.2.7   *Support infrastructure*

Stellenbosch University has developed infrastructure to support the protection, patenting and commercialization of its intellectual property, as well as various other structures that allow for entrepreneurship development. It leads universities in South Africa in the development of intellectual property, with a track record of the highest number of spin-off companies. There is an emphasis and focus on developing, protecting and commercializing their intellectual property. There are innovation hubs in all faculties, where the continuous focus is on entrepreneurship and innovation. This feeds into an internal support system for commercialization. There is also a culture of encouraging staff to generate new ideas that will contribute to making the university more resilient and sustainable.

There are champions in all faculties, usually at the level of the dean, who support and drive entrepreneurship and innovation. In addition, there are individuals who, through their own personal interests, champion entrepreneurship and entrepreneurial thinking. The commercialization process is under constant review to determine how to scale up and make this process more efficient.

Innovus [21] is the technology transfer arm of Stellenbosch University and is a registered independent company wholly owned by the university. Formed 10 years ago, it is responsible for the university's commercialization activities, and acts as a university-industry interaction platform for the commercialization of the intellectual property of Stellenbosch University. It supports the university's innovation and intellectual property portfolio through patenting, the formation of spin-out companies and the management of funds from its commercialization activities. Shareholding in spinout companies is held within a holding company, SU Enterprises (Pty) Ltd. The university's Copyright, Trademarks and Short Courses Division also forms part of Innovus. According to the Innovus website, Stellenbosch University has 24 spin-off companies, some of which are mentioned in this case study.

The university's LaunchLab is an incubator and describes itself as "building the next generation of sustainable, high-impact companies tackling the world's toughest challenges" and creating scalable, high-impact businesses in the agriculture, climate and health sectors that matter to the core of Africa (Stellenbosch University, 2021). It is a shared services platform offering end-to-end incubation services. LaunchLab views entrepreneurship as a "learned science" that not only helps to build great companies but develops people able to navigate the complexities of life. LaunchLab has incubated over 200 businesses to date, creating over 500 direct jobs and generating over R300 million in annual revenue turnover. Its location in and connection to Stellenbosch University provides critical resources, information and expertise to aid its work.

LaunchLab is entrepreneurial in how it operates. Despite the high demand and large portfolio, it operates with only six highly qualified professional staff members who have wide experience and the required critical skills. Committees have been established in departments that work in LaunchLab's focus areas. This offers access to students, and an opportunity to find out what is happening on the ground and relay LaunchLab's information through the committees. LaunchLab also adds value and offers its services to the external entrepreneurial system. In so doing, they can support entrepreneurs and businesses with a wider network of service providers and partners. Their services include advisory services for other organizations that want to set up incubators. LaunchLab is owned by Innovus and operates outside of the university system, allowing for a leaner, flatter and more efficient operation. There are university representatives on its board of directors. It is funded through Innovus and other partners. LaunchLab is looking to scale up its reach, its goal being to have 10,000 students interact with their content. It believes that its experiences with entrepreneurs should be included in the entrepreneurship teaching and learning content of Stellenbosch University.

A centre of excellence in entrepreneurship is currently being established. A senior respondent saw this as a national model for other centres of excellence in entrepreneurship that ought to be funded by the relevant government departments. This will enable relevant knowledge and best practices to be generated for the betterment of the country in a structured manner.

Entrepreneurship at universities is not competitive and should be about collaborations with the aim of building a better South Africa and a better African continent. Collaborations allow the best abilities, specialties and expertise of all universities to come together. If there is a best practice model that is working, it should then be shared, scaled up or replicated for use by all universities, instead of setting up the same services, centres and facilities at all universities. One respondent saw LaunchLab

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[21] For more information on Innovus, see www.innovus.co.za.

as one such model that can be replicated and scaled up to provide entrepreneurship support. Stellenbosch University will also soon be launching a school for climate studies.

Other groundbreaking projects mentioned included a large renewable energy project, with the potential to provide a solution for the entire continent. The aim of that project is to enable solar energy to be accessible to rural and remote parts of Africa. Phago Flux is another start-up at Stellenbosch University; it has developed a medical breakthrough in the detection of a particular protein signature in cells that can clean itself. This is important for neurodegenerative diseases. Under another project, a way of keeping sharks away from nets in the ocean has been produced.

4.3.2.8   Measurement

To understand what constitutes success, it is necessary to know how to measure it and to have an understanding of its impact as part of the measurement of success. Measurement should start with the end in mind, the goal one wants to reach and the way to achieve it. It should not be focused narrowly on products, prototypes and commercialization. Starting with the end in mind allows for the development of proper frameworks, strategy, resource allocation and implementation imperatives to give effect to the success envisioned. Success could cover a range of objectives, for example; establishing an entrepreneurship policy; being a carbon neutral university; contributing to the economy of Stellenbosch; creating jobs; generating revenue; achieving high profit margins; and setting up high-growth viable businesses. For different departments and entities, different measures of success should be developed.

4.3.2.9   Challenges and other considerations

Respondents shared the following various issues:

- Sustainable funding is still a challenge even though Stellenbosch University provides much financial support.

- There is need for what one respondent called "irrational optimism". The examples used to illustrate this were Steve Jobs and Elon Musk, two men considered geniuses and a little crazy, both of which are necessary qualities if you are trying to do something different, big and scalable.

- Coordinating activities is important to avoid duplication and encourage innovations. Working in silos poses a risk for this. For example, there might be work being done on renewable energy in one department and on water in another. These need to be put together for innovating ideas and solutions. Innovation should also include a range of cultures, experiences and backgrounds as this germinates innovation and new ideas.

- The commercialization process needs to be more efficient and capacitated to ensure scaling up. While there might be about 200 patent applications, only about 20, usually identified as the top projects, are commercialized, as there is not enough capacity to commercialize all 200.

- Universities need to be mindful of what young people need or they will be in danger of losing their appeal to young people. In the current context, if degrees cannot create pathways to employment, students will probably pursue training and learning programmes elsewhere that do lead to jobs.

- The entrenched way in which universities operate was considered a limitation. Universities become entrenched in their way of operating, even if it no longer makes sense. For example, lecture periods are 50 minutes long, but there is no scientific rationale for this. The logic for the length of lectures should be based on sound principles to optimize learning. That opens the door to various options, which might look like a 20-minute lecture and a discussion, followed by a workshop. The way assessments are currently structured push students to pass, which ultimately becomes a test of memory. However, memory recall does not always translate into learning. Assessments should be a test of higher-order reasoning, the development of opinions, the application of principles and the understanding of real-time contexts. A three-hour exam cannot fully accomplish this goal. For architecture students, for instance, an example of a good and relevant assessment that considers deep learning could be to get a plan approved by the local municipality. This involves a range of skills related to understanding, reasoning, application, analysis and synthesis of content in a real-world context and optimizes learning.

- While building an entrepreneurial university, one should stay focused on delivering excellence in terms of the core missions of the university, and the commercialization of intellectual property. The core mission of the university cannot be compromised in building the entrepreneurial university.

- The three priorities at Stellenbosch University are: establishing international networks; building sustainable funding; and recruiting the right people for the right positions.

4.3.3 Survey results

The survey is based on and adapted from the framework for advancing entrepreneurial universities in Africa. The survey results cover findings on the seven attributes and the additional question 8, which covers the strategy and mission, support for entrepreneurial programmes, and budget and finance. The findings for the first seven attributes are illustrated with three-point graphs, which were consolidated from a seven-point Likert scale, as explained in the section on research methodology. All five respondents completed the survey.

4.3.3.1   Leadership and governance

Figure 4.17
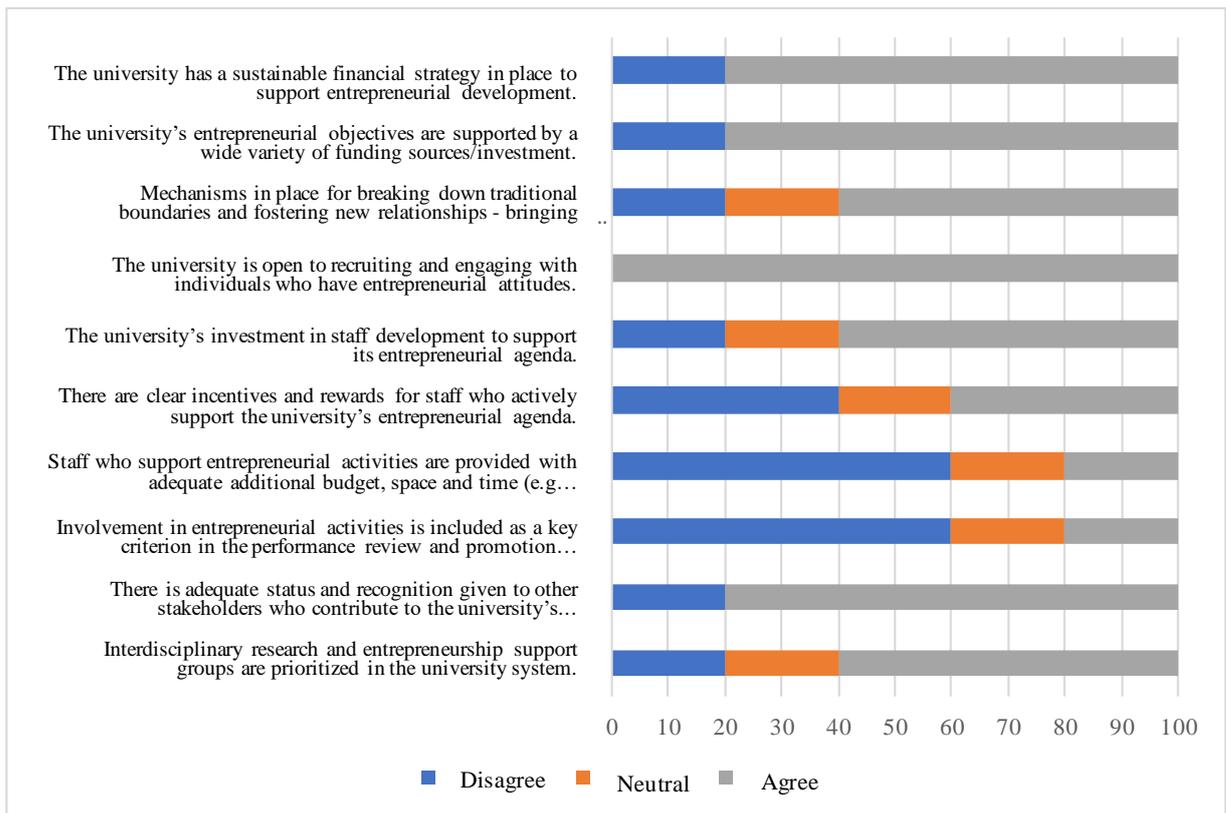**Stellenbosch University – leadership and governance**
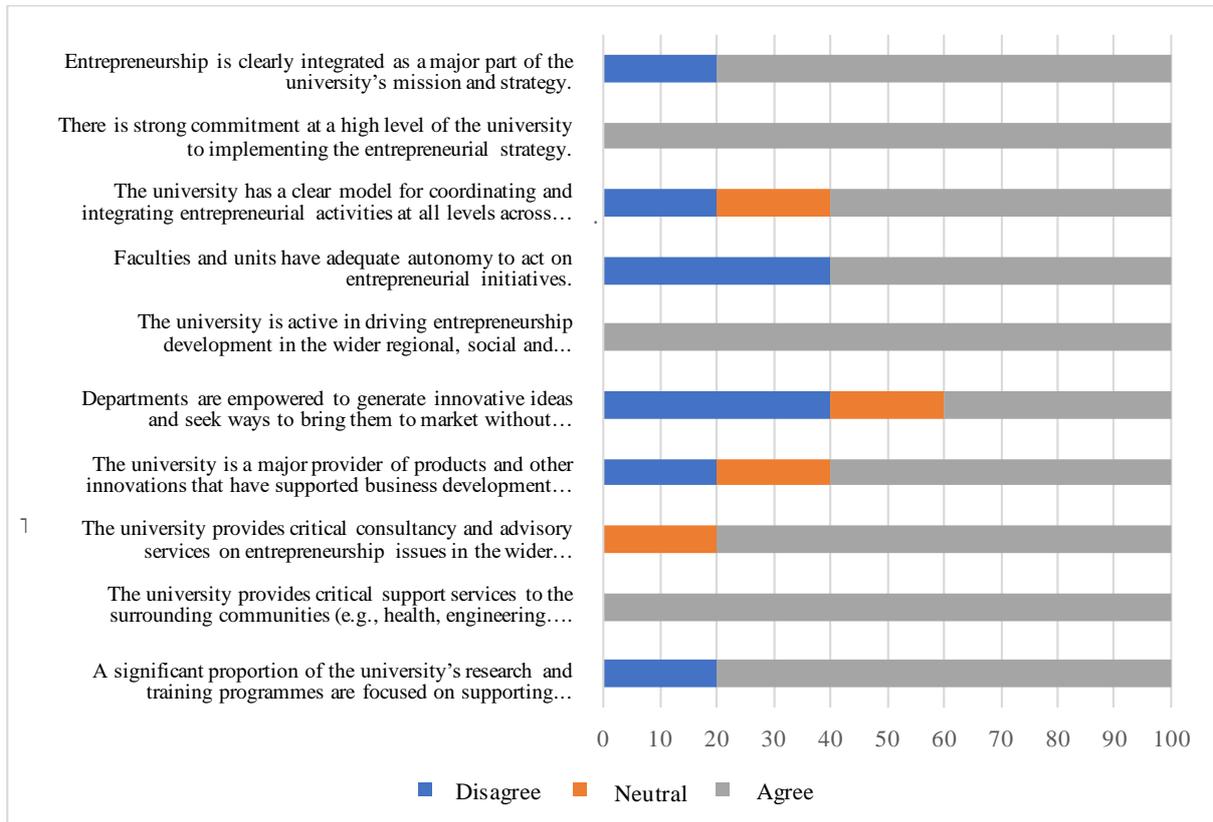
Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

Between 60 per cent and 100 per cent of respondents agreed with the statements on most of the activities measured, except for a split result on whether departments are empowered to generate innovative ideas and seek ways to bring them to market without seeking the approval of senior leadership, with 40 per cent agreeing, 40 per cent disagreeing and 20 per cent neutral.

4.3.3.2   Organizational capacity, people and incentive

Between 60 per cent and 80 per cent agreed on most activities, with a 40 per cent both agreeing and disagreeing with the statement on clear incentives and rewards for staff who actively support the university's entrepreneurial agenda. Overall, 60 per cent disagreed that staff who support entrepreneurial activities are provided with adequate additional budget, space and time, and that involvement in entrepreneurial activities is included as a key criterion in performance reviews and promotion.

Figure 4.18
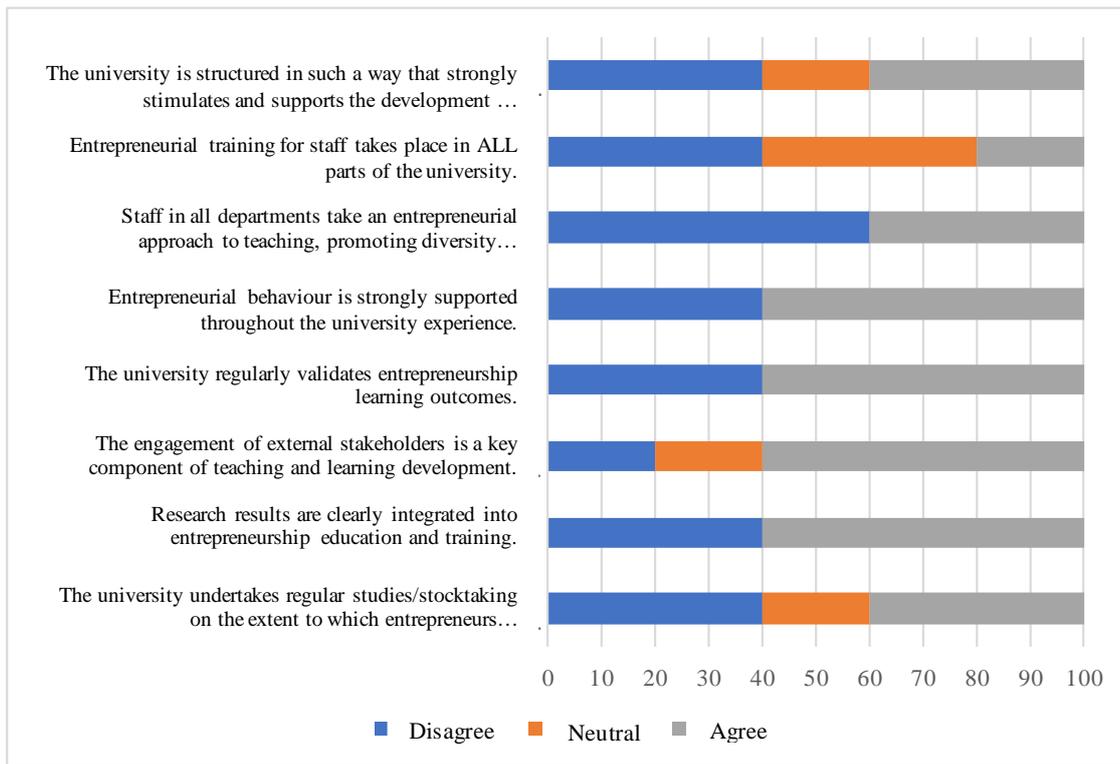**Stellenbosch University – organizational capacity, people and incentives**

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.3.3.3   Teaching and learning

The results illustrated that 60 per cent of respondents disagreed that staff in all departments take an entrepreneurial approach to teaching and promoting diversity and innovation in teaching. There was a split response on whether the university regularly takes stock of the extent to which entrepreneurship is included and integrated at the school level. There was a 60 per cent rate of agreement with all other statements.

Figure 4.19
Stellenbosch University – entrepreneurship development in learning and teaching

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.3.3.4 Pathways for entrepreneurs

Figure 4.20
Stellenbosch University – pathways for entrepreneurs
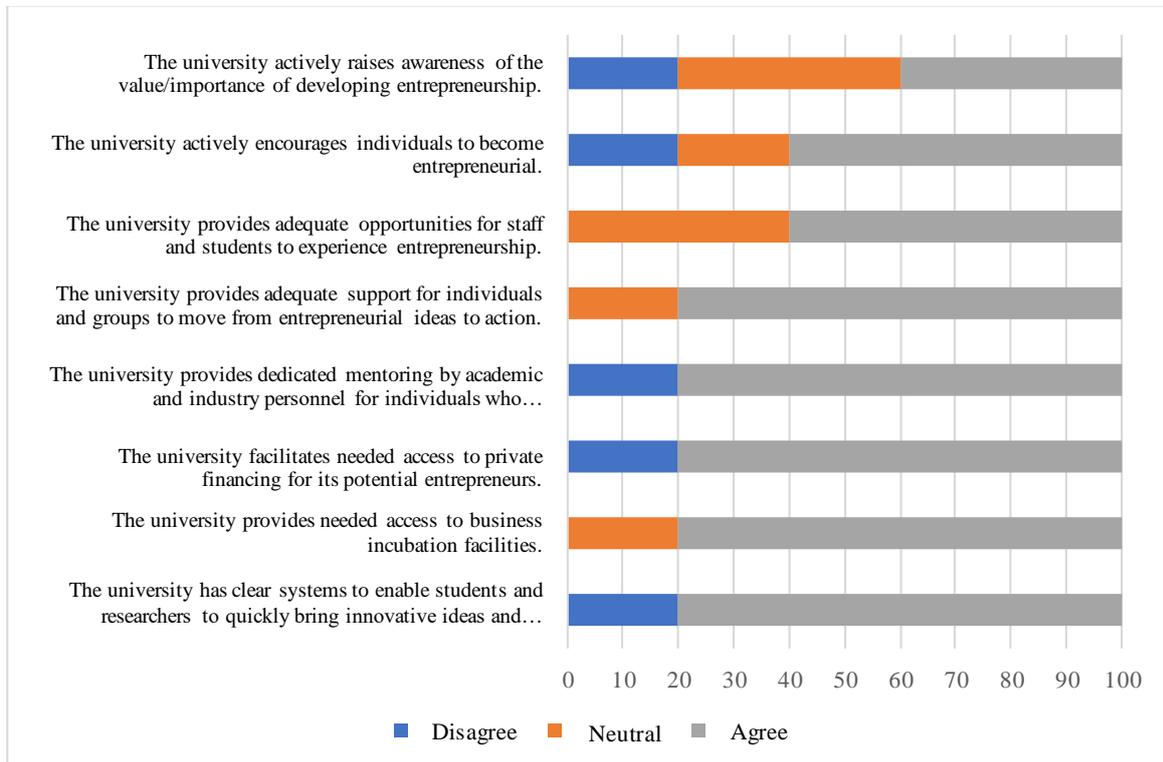
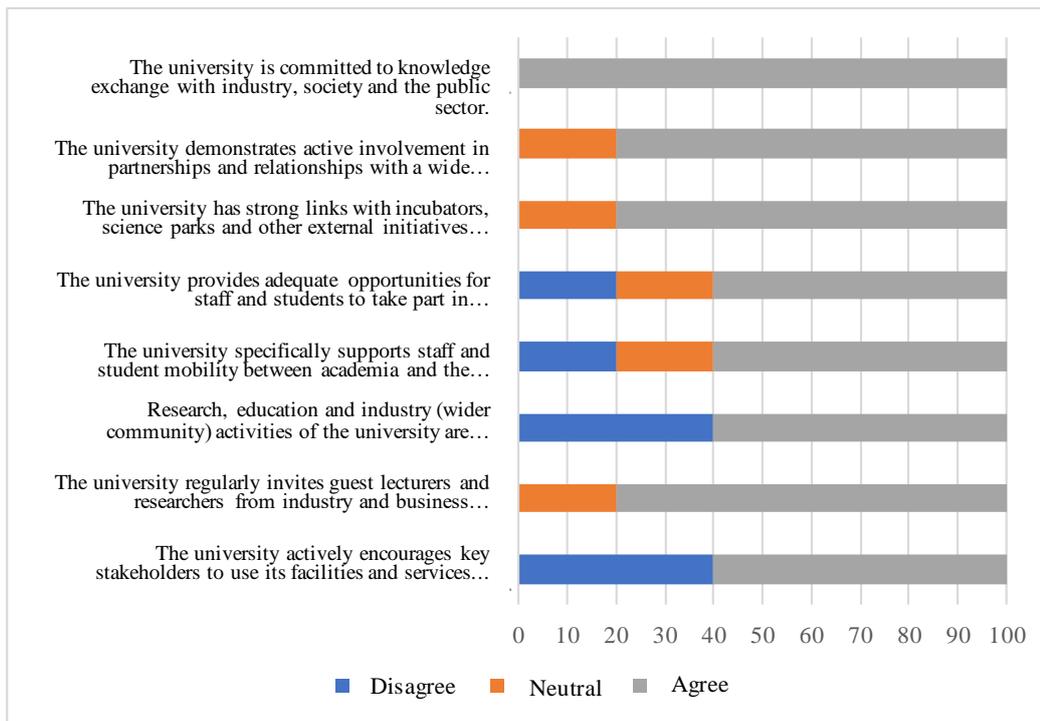*Source:* United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

There was a rate of between 60 per cent and 80 per cent agreement on most of the pathways surveyed, except for a split response (40 per cent agreement, 40 per cent neutral) on whether the university actively raises awareness of the value and importance of developing entrepreneurial abilities among its staff and students.

4.3.3.5 Business/external relationships for knowledge exchange

There was between 60 per cent and 80 per cent agreement with the statements on most of the activates surveyed. The highest rate of disagreement (of 40 per cent) was on research, education and industry activities being closely linked to affect the whole knowledge system of the university, and the university actively encouraging stakeholders to use its facilities and services for entrepreneurship activities.

Figure 4.21
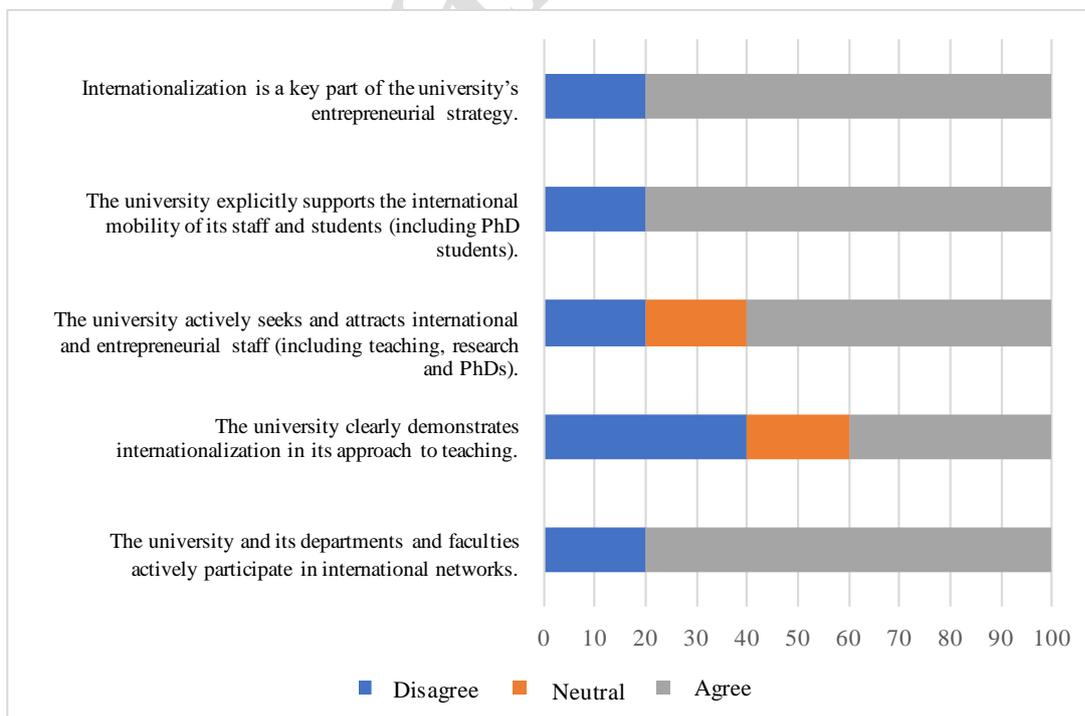**Stellenbosch University – university-business/external relationships for knowledge exchange**

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.3.3.6 Internationalization

Figure 4.22
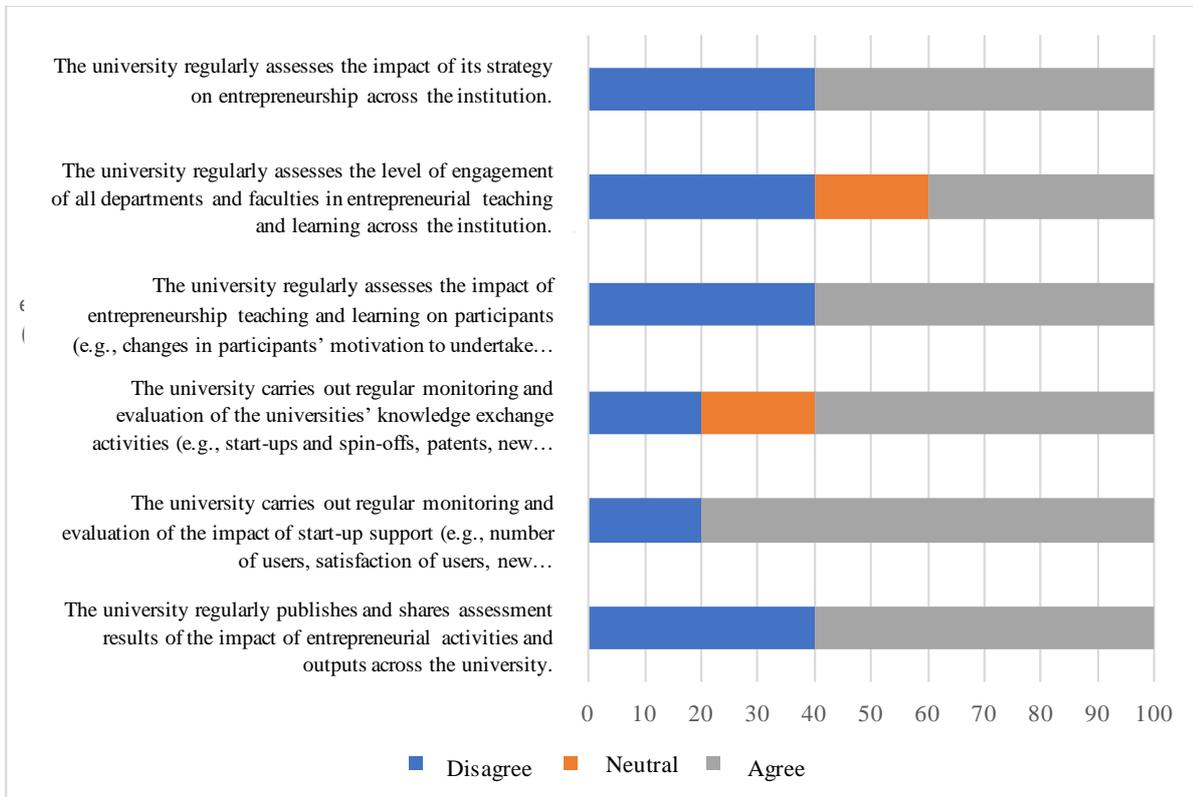**Stellenbosch University – the entrepreneurial university as an international institution**

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

There was an agreement rate of 60 per cent and above on all activities, except for a split response on whether the university clearly demonstrates internationalization in its approach to teaching.

4.3.3.7   Measuring impact

Figure 4.23
Stellenbosch University – measuring the impact of the entrepreneurial university

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

There was an agreement rate of between 60 per cent and 80 per cent on most of the activities being implemented, except for a split response as to whether the university regularly assesses the level of engagement of all departments and faculties in entrepreneurial teaching and learning across the institution.

4.3.3.8   Inclusion in strategy and implementation plan

This question measured whether the following areas were included in the strategy and whether there was a published implementation plan involving them: entrepreneurial learning and teaching; knowledge exchange; technology transfer/commercialization of research outputs; business start-ups/spin-offs and incubation; and the internationalization of the university. There was an agreement rate of between 60 per cent and 80 per cent with the statement that all six imperatives were included in the mission and strategy and have a published implementation plan.

4.3.3.9 *Availability of entrepreneurship support structures, services and programmes*

There responses to the statements on the support structures, services and programmes surveyed were mixed, with 60 per cent and more agreeing that 13 of the imperatives were in place. The highest disagreement rate (of 60 per cent) was on incentive programmes being in place to recognize or award successful entrepreneurial initiatives by staff and students. Moreover, 80 per cent did not know whether there was any recognition or award for outstanding external stakeholders, partners or alumni who actively engaged in and/or contributed to entrepreneurship promotion. Overall, 60 per cent did not know and 40 per cent reported "No" as to whether there was an external panel of private actors (e.g., entrepreneurs, business experts) reviewing and commenting on entrepreneurship-related programmes and courses.

Table 4.6

Availability of support structures, services and programmes: Stellenbosch University (Percentage)

Structure, service or programme	Yes	No	Not sure
a. A central unit/team designated to coordinate entrepreneurial activities across the university.	80	20	
b. A high-level leadership position (e.g., dean/director/chair of entrepreneurship) assigned to oversee the implementation of the university's entrepreneurial strategy.	40	40	20
c. Almost all schools/faculties host a specialized team/unit/centre to coordinate entrepreneurial activities (e.g., technology transfer offices, knowledge exchange centres, industry liaison units, student enterprise development support units).	60	40	
d. A designated unit/team (e.g., alumni office and/or international office) to liaison and manage external relationships with international partners and associates.	100		
e. A designated unit/team to manage intellectual property issues (e.g., patents, non-disclosure agreements, other contractual agreements) of internal knowledge and innovations produced.	100		
f. A central quality assurance unit/team to review the quality of entrepreneurial activities of the university.	40	20	40
g. Shared facilities for research and teaching across faculties and schools for exploiting internal knowledge.	40	40	20
h. Programmes/initiatives to bring successful private sector-based innovators and entrepreneurs to become involved in/support teaching and research.	60		40
i. Seasoned and respected business leader(s) that serve as entrepreneurs-in-residence.	20	40	40
j. Extracurricular and/or non-credit activities and events on entrepreneurship topics delivered by entrepreneurs and business practitioners.	60		40

k. Staff development programmes focusing on entrepreneurial skills, knowledge and techniques for learning and teaching.	40	40	20
l. Incentive programmes in place to recognize and/or award (e.g., cash prizes, awards, certificates, paid study and development leave) successful entrepreneurial initiatives by staff and students.	40	60	
m. Recognition and awards for outstanding external stakeholders, partners and/or alumni who actively engaged in and/or contribute to entrepreneurship promotion.		20	80
n. An external panel of private actors (e.g., entrepreneurs, business experts) to review and comment on entrepreneurship-related programmes and courses.		40	60
o. New entrepreneurship-related programmes and courses introduced in the last three years across the university.	80		20
p. Student international mobility programmes (e.g., international exchange, internship and/or volunteering programmes).	80		20
q. Staff international mobility programmes (e.g., international visiting scholarships, secondment to foreign institutions).	80		20
r. Joint degree and/or research programmes with international partners.	80		20
s. Joint research centres with international partners.	60		40
t. Designated channels (e.g., agents, offices) to recruit international staff and students.	60		40
u. Designated public channels (e.g., printed or online) to disseminate entrepreneurship-related information (e.g., events, outputs, impact) about the university.	60	20	20

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.3.3.10   *Budgeting and finance*

This question measured certain budgeting and finance activities, specifically if the proportion of the university budget allocated for certain activities has grown in the past three years. 60 per cent indicated that there was an increase in budgets for entrepreneurial support services and activities, and that the rate of reinvestment of the university's entrepreneurial income and domestic private income had increased. In all cases where there was low agreement on the budget increase, there was high rate of respondents who did not know.

Table 4.7
Budgeting and finance: Stellenbosch University
(Percentage)

Budgeting and financing	Yes, it has grown	No, it has not grown	Not sure/No information	No separate budget
a. (Direct) entrepreneurial activities	20		80	
b. Entrepreneurial support services/activities	60		40	
c. Internationalization activities	40		60	
d. Knowledge exchange and engagement activities with external parties	40		60	
e. Staff training and development focusing on entrepreneurial-related knowledge and skills	40		60	
f. Reinvestment of the entrepreneurial income of the university	60		40	
g. Domestic public funding	20	20	40	20
h. Domestic private funding	60		20	20

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

4.3.4 Conclusion (Stellenbosch University)

All respondents subscribed to the notion and value of an entrepreneurial university. Although there was differentiated understanding of the definition, the responses were aligned with the accepted broad definition of an entrepreneurial university. All respondents also agreed that the framework for advancing entrepreneurial universities in Africa was a suitable tool for reviewing South African universities.

Stellenbosch University's approach to building an entrepreneurial university appears to be focused on commercialization. The leadership commitment, infrastructure established and resource considerations have contributed to a commercialization framework that has yielded good results, namely, the highest number of spin-off companies among universities in South Africa.

The ownership and accountability for entrepreneurship is strategically located at the level of the deputy vice-chancellor, which gives it gravitas, agency and access to other parts of the university. While the interviews did not explore the commitment of other members of the senior leadership, the survey indicates a strong level of agreement with the statement that there is leadership support at the highest level. The leadership has also been engaged and involved at the faculty level, with deans being cultivated as entrepreneurship champions.

There is strong technical support for patenting and the commercialization of business, and there appears to be an effective internal system. However, this will have to be expanded and deepened if there is a need for it to be scaled up. The support appears to be aimed at postgraduate study and research, with the potential for commercialization, although it does appear that entrepreneurship activities and support for undergraduates is now being considered and developed.

There is also support for capacity-building in technology, with a dedicated technology fund. Incubation support for academics stepping into major roles in spin-off companies is also available. Respondents suggested changes to the current incentive system as it did not support broad entrepreneurship activities, even though there were rewards for patenting and commercialization.

5. Discussion of findings

This section is focused on the discussion of findings, including commonalities, differences, needs and considerations that emerged across the three universities represented.

The discussion is informed by results from both the surveys and the interviews. The survey results in most of the responses corroborated the results from the interviews. In a few instances where contradictions occurred, respondents were mostly neutral or did not know the information required.

Several responses informing university initiatives and plans in terms of entrepreneurship development were consistent with aspects of emerging practice that were found in the literature survey and the "National university entrepreneurship ecosystem baseline report". Some of these responses concern the need for senior champions, external knowledge partners, industry partnerships, protection and patenting of intellectual property, entrepreneurship pathways for students, capacity-building and responding to local, regional and national socioeconomic development needs.

5.1. Definition of an entrepreneurial university

Definitions of concepts related to entrepreneurship are often controversial, and definitions of the term "entrepreneurial university" are no exception. In the case of responses from the three universities in question, the following attributes emerged as broad definitions of what constitutes an entrepreneurial university. All the respondents referred to an expansion of the present traditional model of the South African public university based on its core mandate of research, teaching and learning, to include adding value to their current contexts, and the development of graduates to prepare them for life after university.

Qualities and characteristics

Respondents associated the entrepreneurial university with several qualities and characteristics. The following is a consolidated list of their various responses:

- A university that is constantly renewing its processes, putting a high premium on innovating new products and spinning out new companies, and constantly renewing its academic offering in terms of efficiencies and relevance.

- Commercialization of research, knowledge outputs and intellectual property to contribute to third-stream income and community incubators. Utilizing assets or academic services to mobilize resources for the university.

- A university at the cutting edge of innovation.

Teaching and learning

The following points relate to common aspects related to teaching and learning that emerged from the respondents' understanding and definition of an entrepreneurial university:

- Having a learning and teaching model that is relevant and responsive, meaning that it adds value to the context.

- Generating relevant and necessary research and designing relevant curriculum content.

- Using its intellectual property and resources with partners to solve society's problems and contribute to socioeconomic development.

- Adopting and applying more experiential teaching methods.

- Rethinking the provision and purpose of education, as a change from the traditional model.

Benefits for students

Most respondents shared the following as the benefits of the entrepreneurial university for students:

- Prepares graduates for a changed and changing future world of work and facilitates employment opportunities.

- Cultivates an entrepreneurial mindset in students. Produces graduates who are innovative and creative, embrace challenges and want to break new ground.

- Develops the capacities of students so that they can navigate change throughout their lives.

- Equips students with the knowledge and business skills to become successful after graduation.

- Finds opportunities for skills development, such as internships, and produces graduates who can make a difference in the world.

- Helps students to start businesses.

Impact

The following points were shared as possible impacts of the entrepreneurial university:

- Promoting student entrepreneurship, research and intellectual property to contribute to socioeconomic development.

- Having a positive impact on communities and society.

- Working in the space between the formal and informal economy.

- Generating and developing local solutions for industries and society.

- Facilitating business start-ups and job creation.

Table 4.8 outlines the different approaches of three universities to becoming an entrepreneurial university.

Table 4.8
Comparative approaches to becoming an entrepreneurial university

Entrepreneurship imperative	Durban University of Technology	Nelson Mandela University	Stellenbosch University
Ownership and accountability of entrepreneurship	Deputy Vice-Chancellor: Research, Innovation and Engagement	Four departments: Strategic Resource Mobilization and Advancement, Innovolve (for commercialization) and Student Affairs with Teaching and Learning.	Deputy Vice-Chancellor: Research, Innovation and Postgraduate Studies
Entrepreneurship policies for students	Student entrepreneurship policy across all faculties: all undergraduate students to take compulsory course; and maps student entrepreneurship development support and infrastructure	Student entrepreneurship policy for student entrepreneurs and provision and allocation of the required resources	No specific policy in place
Graduate qualities	Adaptive graduates for an evolving world of work who can make a difference in their personal lives and the world	Graduates with skills, literacies and competencies, responsive to the current world of work and who can make a difference in the world	Graduates with businesses who can make a difference in the world
Intellectual property	Technology transfer, patent and incubation support for academics and all students	Technology transfer, patent and incubation support for academics and all students	Technology transfer, patent and incubation support for academics and postgraduates
Staff support	Capacity-building for entrepreneurship activities, teaching and learning, and opportunities for consulting	Capacity-building for entrepreneurship activities and teaching and learning, and opportunities for consulting	Capacity-building and funding available for patent registration and commercialization
Community focus	Community engagement as part of the teaching and learning experience and process	Community engagement as part of the teaching and learning experience and process	Community support as part of social responsibility outreach
Funding for student entrepreneurship support and activities	University plus partners	Strategic Resource Mobilization and Advancement Office	Competitions and social impact fund
Incentives for academics	Income incentives for consulting. No incentives for promoting entrepreneurship activities	Income incentives for consulting. No incentives for promoting entrepreneurship activities	Incentives for patent registration and commercialization efforts

Support structures	Durban University of Technology Innovation Hubs, Centre for Social Innovation, Centre for Social Entrepreneurship and Rapid Incubator, Department of Entrepreneurship Studies, Coordinating Centre for Entrepreneurship, Technology Transfer and Innovation Unit, student support desks and coordinators in all faculties	Madibaz Hub, Propella, Innovolve, Maker Space	LaunchLab, Innovus, deans as champions, hubs in all faculties, innovation committees in selected departments
Coordination	Coordination Centre	No clear coordination mechanism in place	No clear coordination mechanism in place

Source: United Nations, ECA, Advancing entrepreneurial universities survey, South Africa, 2021.

5.2. Commonalities and similarities

As demonstrated in table 4.8, the three universities have each charted a different course to become more entrepreneurial and embrace entrepreneurship development, with support, buy-in and commitment from the highest levels of leadership.

All respondents from the three universities agreed that there was a need for the development of entrepreneurial universities in South Africa and the rest of Africa to contribute to increasing their societal impact. There was also a consensus that the core university mandate should be expanded from the current traditional approach, which was focused only on research, teaching and learning. This expansion should include generating relevant research that can add value, provide solutions and facilitate business start-ups. Student development that is responsive to a changed and continually changing world of work, and university engagement with society and communities, should have a positive impact. In other words, universities should be in service of what Nelson Mandela University terms the "public good". All three universities showed evidence of an evolution towards being more entrepreneurial, albeit in different ways.

The results generally indicated a strong level of commitment from leadership, with entrepreneurship embedded in the universities' strategies, along with implementation imperatives. The ownership and accountability for entrepreneurship was located at the level of the deputy vice-chancellor level for two universities. All three universities demonstrated evidence of commitment and activity (albeit limited in some instances) through strategic recognition, enabled implementation, infrastructure and capacity development, resource support, partner engagement, teaching and learning transformation, and enablement of commercialization, all of which was aligned with both internal and external systems and increased the focus on entrepreneurship.

Technology transfer support was established in all three universities, two within an independent registered entity and one within a directorate. There was incubation support infrastructure in all three universities, with varying degrees of established end-to-end support for student entrepreneurship. All three universities also had mechanisms in place for university consulting services with the public.

What was also evident in all three universities was advanced internationalization and local (private, public and civil society), continental and global partnerships, although this was not consistent across all faculties and departments.

All three universities had varying degrees of success in various initiatives, and all three had imminent plans to expand various initiatives.

5.3. Differences

One university had clear direct language on its commitment to entrepreneurship in its 10-year strategy, while the other two had a more indirect articulation of their commitment to entrepreneurship through entrepreneurial elements contained in their vision, mission, enablers and implementation imperatives.

There appeared to be different priorities and focuses among the three universities, specifically student entrepreneurship, resource mobilization and commercialization.

Ownership and accountability for entrepreneurship was located at the level of the deputy vice-chancellor or across multiple departments.

Courses were either offered within another course or through co-curricular initiatives.

5.4. Needs and requirements

All of the universities recognized the need for more research and information on best practices and knowledge-sharing.

Some aspects that emerged as possible areas for attention and development were the inclusion of entrepreneurship activities in the key performance indicators of staff and departments. Also lacking were clear incentives, recognition and awards for staff achievement in entrepreneurship activities and for outstanding contributions of external stakeholders, partners and alumni. Another issue raised was the need for a proper understanding of how to provide the right support and enablement for student and academic entrepreneurship.

One of the universities had started considering a measurement for its impact framework. None of the universities has a measurement framework in place. Measures of success should not only be focused on the university's outputs, for example, policy development, incubator set-up or the number of start-ups established. Measures should also include the outcomes (changes achieved) and impacts (the effects), both internal and external to the university, for example, a change of mindsets, solutions developed for communities and society, change in the institutional culture and changed behaviour.

5.5. Common concerns

The sample respondents raised the issue of sustainable funding for entrepreneurial activities. While the universities had made some resources and funding available, these resources were not enough to cover the full range of activities in building an entrepreneurial university.

Capacity was another common concern of respondents, specifically having the right capacity in the right positions to envision, plan, develop, undertake and oversee the various actions and initiatives that are required. Another concern raised by many was the traditional mindset of many

academics, which was a challenge for establishing buy-in for entrepreneurship and its related activities, for example, transdisciplinary research.

An issue raised by all three institutions was the lack of dedicated time for entrepreneurship activities. Unless entrepreneurship is course-related or included in a staff member's core role, it is not included in the timetable. As a result, most entrepreneurship-related activities had to happen after hours or during people's personal time. Most respondents recommended that there should be time allocated in timetables for entrepreneurship activities, for example, engagement with intellectual property offices, involvement in commercialization processes or involvement in entrepreneurship extracurricular activities or competitions. Another issue raised by all three universities was the challenge of working in a bureaucracy. Building an entrepreneurial university requires organizational and mindset changes, which require flexible and adaptive environments. Bureaucracies make for inflexible spaces that present an obstacle to some of the required changes.

Curriculum content development, applied and experiential teaching and learning methods, and more project-based assessments were also among the issues raised. Two of the universities raised the need for transdisciplinary and multidisciplinary programmes and projects, and the need to create buy-in for these.

Some notable developments from the three universities were the introduction of entrepreneurship policies in two universities, although the focus of each varied slightly, the development of entrepreneurship champions, the placement of coordinators, and the establishment of innovation committees in faculties.

A concern that was raised at the verification workshop was the challenge of instilling the spirit of entrepreneurship in students, considering the recent looting and violence where many entrepreneurs were affected and lost everything. [NB: The verification workshop was held during the week of extreme looting and criminality in South Africa, where thousands of people, including entrepreneurs, were affected and lost their assets and livelihoods.] The response to this challenge spoke to the need for students to have an understanding of the risk involved in setting up their businesses, and how to mitigate these risks.

An observation of a deputy vice-chancellor at the verification workshop was that while the findings indicate a variety of activity, it appears that universities are just coming "out of the starting blocks" in building entrepreneurial universities. He asserted that the findings of the present study are crucial to developing university strategies to accelerate entrepreneurship to where it must be. It was further added that the crisis in South Africa is an opportunity to rebuild creativity. The Director of the Entrepreneurship Development in Higher Education programme suggested that its annual lekgotla host a session on rebuilding ideas for universities and adding value to the rebuilding efforts that the country will need.

The ECA representative at the verification workshop raised three challenges: engaging the private sector and communities so that universities can become instruments of social change; ensuring that students participate and benefit from the offerings of entrepreneurial universities; and enabling the effective knowledge and skill-sharing of universities on a continental platform to address African challenges. It was agreed that the United Nations would explore a platform to enable the engagement of African universities. It was suggested that the Entrepreneurship Development in Higher Education programme engage African universities in its rebuilding efforts.

5.6. Comments on the role of the Entrepreneurship Development in Higher Education programme

Most respondents were familiar with the national role and mandate of the Entrepreneurship Development in Higher Education programme and acknowledged its critical role in raising awareness and elevating the entrepreneurship agenda at universities. They believed that the spaces created through the communities of practice, information-sharing, the lekgotla and capacity-building workshops should continue, albeit with a view to be scaled up to include more staff members and students.

The suggestions for expanded support from the Entrepreneurship Development in Higher Education programme included:

- Setting up and facilitating partnerships and access to industry and the private sector for collaborations, learning, teaching and research.

- Facilitating access to government departments for collaborations and unlocking government funding.

- Developing national policy guidelines.

- Establishing benchmarking and key indicators. While all respondents thought that the framework for advancing entrepreneurial universities in Africa was a suitable one for an entrepreneurial university, some felt that the aspects of the seven attributes should be benchmarked.

- Including private universities in the portfolio of the Entrepreneurship Development in Higher Education programme.

- Coordinating the generation of relevant research to fill knowledge gaps and share excellence, emerging sustainable best practices and showcasing successes.

- Encouraging and supporting individual collaborations between universities.

- Organizing study tours to other successful entrepreneurial universities.

- Setting up centralized engagement with other African universities and systems.

6. Recommendations

The recommendations are based on the common requests made by the university respondents, related relevant emergent best practices in the literature review, and inductive analysis of the results and findings. While these recommendations are based on the findings from the three universities, they might be relevant to the broader public university sector in South Africa. These recommendations ultimately contribute to three major imperatives:

- To map and provide a more complete understanding of the complexity, needs, challenges and status quo of internal university entrepreneurship systems, in order to optimize enablement, support and development in building entrepreneurial universities.

- To map and provide a more complete understanding of the context of local, regional and national entrepreneurship systems and public and private partners to enable and facilitate linkages, partnerships, resource mobilization and sharing, integration, coordination and alignment towards a positive socioeconomic impact and development.

- To guide programmes, initiatives and investments for universities, the Entrepreneurship Development in Higher Education programme and ECA to help universities to become producers of goods and services.

6.1. Audit and baseline of entrepreneurship in universities

Owing to siloed activities or a lack of a central coordinating mechanism, coordination emerged as one of the main challenges. It is recommended, therefore, that universities conduct an audit of all their entrepreneurship related programmes, projects, activities and initiatives. This recommendation also emerged from the "National university entrepreneurship ecosystem baseline report" of the Entrepreneurship Development in Higher Education programme. The recommended audits should serve as a baseline for universities to provide a more complete and more accurate picture of the university landscape and internal system in order to set a starting point to plan and map implementation of strategic objectives. Only once there is full insight into what, where and how entrepreneurship is unfolding at a university can a proper consolidation, integration and coordination framework be put into place. This also allows for internal partnerships and programmes, avoids duplication of efforts and optimizes the use of resources. There is much value in the recommended baseline studies and audits. They can further complement and consolidate the "National university entrepreneurship ecosystem baseline report" to offer a more precise mapping of activities at universities, and it is recommended that the Entrepreneurship Development in Higher Education programme facilitate a guiding framework for the audits and baseline reviews. Mapping and identifying the universities' systems will also provide evidence of their successes, strengths, challenges and resources, which can be used as a basis to explore twinning with other universities for capacity-building and support.

6.2. Monitoring and measurement framework

Based on the finding that not all universities have a monitoring and measurement framework, and the suggestion of some respondents for benchmarking and indicators, it is recommended that the Entrepreneurship Development in Higher Education programme facilitate the development of a university entrepreneurship measurement framework that will standardize and guide the measurement of success at universities. Impact measurement should have both an internal and external focus. Some measurement imperatives suggested by respondents for these measures are: the number of student service providers; student businesses started on campus; student businesses that are successful beyond the university; external knowledge partners and other entrepreneurship-related partnerships; changed teaching and learning methodologies; increased budget allocation; incentives and rewards; the impact of graduates on society; contribution to growth and development in the economy; and job creation. Measurement should be linked to agreed targets and outcomes for each university, guided by the framework. The framework for advancing entrepreneurial universities in Africa might be adapted as a framework for monitoring, benchmarking, strategy development and measurement. The need for benchmarking and the use of the framework for advancing entrepreneurial universities in Africa is also a recommendation under the "National university entrepreneurship ecosystem baseline report" of the Entrepreneurship Development in Higher Education programme. The added benefit of such a standardized framework enables it to be consolidated into a national monitoring and measurement framework, which allows for the monitoring and evaluation of progress and impacts.

6.3. External systems and partnerships

It is recommended that the external systems of universities be mapped. This will provide more information and greater insights into the local entrepreneurship development context of universities and offer universities themselves added insight into many of the entrepreneurship activities measured by the framework for advancing entrepreneurial universities in Africa, namely, engagement; collaboration and partnership with external stakeholders; knowledge exchange; exposure; development and learning opportunities for students; expanding the level of support for student entrepreneurship; and identifying resource and funding partners. Learning opportunities should include internships, practical learning opportunities and apprenticeships.

It is also recommended that the external context of South African higher education entrepreneurship development at a macro level be mapped to understand the various public, private and civil society sector actors in play. This should include consideration of the relevant mandates, roles and relationships, identifying areas for strategic collaboration and partnerships. This allows for the alignment of the macrosystem, identifies duplications and optimizes the use of resources for entrepreneurship in higher education. It opens the door and creates opportunities for organizing and engaging actors, establishing collaborative and partnership agreements, and identifying resources and funding opportunities.

The role of the Entrepreneurship Development in Higher Education programme is to facilitate the mapping of the macrosystem, identify common partners and players in the university's regional systems, and convene meetings and centralize engagement agreements with partners in the system from the public, private and civil society sectors. The agreements should allow universities to set up independent relationships with partners. This offers mutual benefits for partners and universities, as demonstrated by the case studies. Specifically, for example, the engagement of Durban University of Technology with Illovo on waste management, the partnership of Nelson Mandela University with Eastern Cape province in the development and implementation of the ocean economy, and Stellenbosch University's partnership with the African Union Development Agency on renewable energy. Added value for these engagements lies in building channels for access to markets for student university start-ups and spin-off companies.

6.4. Research repository

Based on recommendations from many respondents for more knowledge and information – and as part of the role of the Entrepreneurship Development in Higher Education programme – there is a need for the establishment of a repository of research, recommended audit reports, relevant studies and university policies, partner engagement agreements (as recommended in the point above) that have been entered into, lessons learned and best practices. Gaps in knowledge that were identified in the survey could be consolidated into a list to inform the future research work of the Entrepreneurship Development in Higher Education programme in South Africa. Universities could also contribute to the list according to their knowledge needs and select subjects from the list, with postgraduate students also able to do so for prospective research. This contributes to filling knowledge gaps, provides a deeper understanding of entrepreneurial universities and influences relevant research. The communities of practice of the Entrepreneurship Development in Higher Education programme could play a coordinating and consolidating role in relation to the research list. Some of the knowledge gaps and needs cited in the present study and recommended for exploration should be on this list of knowledge needs, for example, investigation of all stakeholders and actors in the higher education entrepreneurship context in South Africa, their intersecting mandates, their relationships with each other and the extent of collaboration between them, as suggested under section 3 of the report.

6.5. Regular discussion forums

Based on a call by many respondents, the Entrepreneurship Development in Higher Education programme should coordinate regular discussion forums with universities and other stakeholders throughout the year. This should be led by the five communities of practice relevant to their focus areas: entrepreneurial universities; entrepreneurship research; learning and teaching; student entrepreneurship; and studentpreneurs. This is in addition to projects on women in entrepreneurship, the annual lekgotla of the Entrepreneurship Development in Higher Education programme, and capacity-building workshops currently being hosted.

An issue for exploration that was raised by all the universities was that of the challenges brought about by bureaucracy. It raises the question: how does one establish an enabling environment, adaptable structures, systems, processes and flexible teams that encourage and enable an entrepreneurial culture in a university? Another common and pertinent request from respondents is for the exploration and sharing of more experiential teaching and learning methodologies for entrepreneurship education.

The recommended discussion forums create a culture of learning, sharing and engagement, and start to identify and fill knowledge and information gaps across universities. Inter-university engagement should be encouraged as it creates opportunities for resource and other sharing, partnering and collaborations around universities' strengths and specializations. There should be more exploration of collaboration and partnering with other universities in the area of tender proposals. Universities might have a limited capacity to apply for tenders, but collaboration might solve this issue. There is the potential to unlock government funding by having universities work together, as demonstrated by Nelson Mandela University.

6.6. National policy for university entrepreneurship development

Most respondents identified the need to develop a national policy for entrepreneurship development in higher education, which they suggested should be facilitated by the Entrepreneurship Development in Higher Education programme. A national policy would add value, create agency and inform a common national definition of entrepreneurial universities. It would set forth basic strategic and implementing principles, align universities so as to support other related national objectives and create a compliance imperative for universities. Policy development should include minimum standards for infrastructure and resources for universities for entrepreneurship activities and systems.

6.7. Capacity and skills

There is a need for a more precise understanding of the required capacities and skills for entrepreneurial universities and their entrepreneurial systems. The exploration, understanding and mapping of the capacities and skills might be located within the different communities of practice of the Entrepreneurship Development in Higher Education programme. Member universities in the communities of practice could choose to develop required training courses to respond to the skill needs. Not all universities need to develop their own courses. Different universities can design and deliver different capacity-building initiatives according to their willingness, expertise and ability to do so. This establishes universities as service providers for each other. The capacities and skills, once identified and framed, could be included for support from the University Capacity Development Programme at the Department of Higher Education and Training. Capacity-building can entail staff exchanges, study tours and more. External service providers can also be considered to provide capacity-building to universities. The need for a proper mapping and understanding of skills

requirements also emerged as a recommendation from the "National university entrepreneurship ecosystem baseline report".

6.8. Incentives

There should be an exploration of how and by what means support for entrepreneurship in universities can be incentivized. As suggested by many respondents, these incentives could expansively cover incentives for innovation, technology development and transdisciplinary research on entrepreneurship. Incentives need not only be monetary, but could also be in the form of, for example, recognition, awards, opportunities for skills development that enrich staff profiles and curricula vitae, the provision of space and latitude for staff to explore and implement their creative ideas, or travel incentives. The performance management system should include incentives for entrepreneurship activities similar to teaching, research and community engagement imperatives. There should be exploration of establishing dedicated space and time for innovation, entrepreneurship discussion and development, and entrepreneurship activities for students and academics within academic workload models.

6.9. Funding and resources

Sustainable funding was a challenge that was emphasized by all universities. A recommendation based on the approach of Nelson Mandela University – see the Strategic Resource Mobilization and Advancement unit under the Nelson Mandela University results – is to view funding as one category of the university's required resources. There should be a proper understanding of the different categories of resources needed and their purpose, namely, capacity-building, research, infrastructure development and commercialization. Some of the resource needs of universities may be available under the University Capacity Development Programme and other funding agencies, such as the Small Enterprise Development Agency, the Small Enterprise Finance Agency and the Technology Innovation Agency. This also emerged as a recommendation from the National university entrepreneurship ecosystem baseline report". Once the external system mapping is complete (as recommended in point 6.6), the Entrepreneurship Development in Higher Education programme should convene a meeting of public and private partners and stakeholders to share a consolidated resource plan for universities. It could be possible to consider establishing a central joint fund with partners (in line with the Bulgaria country review recommendations in section 4 of the report), or identifying partner capabilities, resources and ideas that would meet some of the resource needs of universities. International funding partners identified though ECA should also be invited to the gathering of partners. ECA should facilitate engagement with these international partners.

6.10. Engagement with universities and structures in Africa

It is recommended that ECA facilitate and enable engagement with African universities to build a network for African universities. This will facilitate both regional and continental efforts towards identifying specializations, collaborations, partnerships, exchanges and twinning for teaching and learning, research, producing goods and services, and utilizing intellectual property. ECA could also identify other enablement regional and continental structures and partners, for example, the African Continental Free Trade Area, an African Union initiative that provides a strategic framework for delivering on continental trade, thereby boosting African trading in the global market for inclusive and sustainable development. This opens up avenues to make universities' intellectual property accessible to African and global markets. Identifying such partners also facilitates the mapping of an African system that can support the advancement of entrepreneurial universities.

7.   Conclusion

The objective of the present study was to provide ECA with a snapshot of the position of universities and their current practices, needs and challenges in becoming entrepreneurial. It was not intended to be an assessment, but rather a review of the categories, in line with the framework for advancing entrepreneurial universities in Africa, of entrepreneurship activities, programmes and developments at the selected universities.

Based on the results and findings of the present study, all three universities reviewed subscribed to and agreed with the value of becoming an entrepreneurial university, albeit with different strategic and structural approaches, and varied choices of initiatives and dedicated resources. While there were different understandings of what constitutes an entrepreneurial university, they all pointed to a re-examination of what universities do and how they do it in order to optimize their added value and have a positive impact on the world. The different approaches, successes and lessons learned of the three universities offer emerging practices that should be shared with all universities, as should other emerging practices from other universities, once identified.

The focus on becoming entrepreneurial and the process itself differed between the three universities. This is instructive since there should not and cannot be a single approach to becoming entrepreneurial. While a policy and standardized framework would be beneficial by offering critical guidance to universities, each university should be guided by its own realities. How all 26 universities will undertake this journey will make for rich learning, promising emerging practice and lessons learned.

A consideration for universities in becoming entrepreneurial in a context of resource constraints and their own transformation priorities is how to be entrepreneurial in their approach. This will require universities to discuss and explore issues such as whether there is need for each university to have its own infrastructure, programmes, equipment, capacities, centres of entrepreneurship and resources for entrepreneurial graduates, and whether each university needs to commercialize its intellectual property and facilitate student entrepreneurship. Could this instead be done by sharing resources, combining capacities, and forming university partnerships and regional collaborations where possible? These collaborations between universities can be formalized along the lines of the Cape Higher Education Consortium model – as described under the Stellenbosch University results – or dealt with on a case-by-case basis.

Higher education in South Africa is delivered within a unique context and system. Ultimately, to effect sustainable change to develop entrepreneurial universities, what is required are robust collaborative and adaptable systems that can support, aid and adjust to the needs and realities of universities. The relationships within these systems should be optimized to create added value for all concerned. The Entrepreneurship Development in Higher Education programme has a critical coordination, alignment and integration role to play in this.

The Entrepreneurship Development in Higher Education programme has a critical advocacy, coordinating, leading, integrating, knowledge and capacity-building role to play. Through the communities of practice, access to vice-chancellors, and the imminent appointment of activation officers at universities, the Entrepreneurship Development in Higher Education programme is ideally placed to guide, support and monitor development at universities. Another role for the programme is to integrate, align and consolidate the critical actors and stakeholders in the South African context that can create efficiencies, unlock opportunities and resources, and avoid duplications of effort. The conundrum is in ensuring that when building entrepreneurial universities, one is mindful of the other

challenges in the South African and higher education contexts, as shared under section 3, and ensuring that the developments do not perpetuate or increase challenges and inequalities, instead of contributing to added value at all levels.

References

Abreu, Maria, and Vadim Grinevich (2013). The nature of academic entrepreneurship in the UK: widening the focus on entrepreneurial activities. *Research Policy*, vol. 42, No. 2 (March), pp. 408–422.

ACCORD (n.d.). Trust between citizens and institutions. Available at www.accord.org.za/COVID-19/trust-between-citizens-institutions/.

Achampong, Joyce, Christopher Hill and Elli Yannakaris (2020). National university entrepreneurship ecosystem baseline eeport. Pretoria: Universities South Africa and the Entrepreneurship Development in Higher Education Programme.

Addis Ababa University (2015a). Addis Ababa University strategic plan (2015/16–2019/20). Addis Ababa.

_____(2015b). Addis Ababa University gender policy. Addis Ababa.

African Union Development Agency (2019). *African Innovation Outlook III 2019*. Johannesburg.

Altmann, Andreas, and Bernd Ebersberger (2013). Universities in change: as a brief introduction. In *Universities in Change: Managing Higher Education Institutions in the Age of Globalisation*, Andreas Altmann and Bernd Ebersberger, eds. New York: Springer – Innovation, Technology, and Knowledge Management series.

Audretsch, David B. (2014). From the entrepreneurial university to the university for the entrepreneurial society. *The Journal of Technology Transfer*, vol. 39, pp. 313–321.

Badat, S. (2010). The challenges of transformation in higher education and training institutions in South Africa. Development Bank of Southern Africa.

Bahir Dar University (2015). The second five years (2015–2019) strategic plan for vision of wisdom. Bahir Dar, Ethiopia.

Baldry, Kim (2016). Graduate unemployment in South Africa: social inequality reproduced. *Journal of Education and Work*, vol. 29, No. 7 (July), pp. 788–812.

Bawakyillenuo, Simon, and others (2013). Tertiary education and industrial development in Ghana. International Growth Centre, Policy Brief 33012 (August). London.

Belete, Wondelsson (2013). Promoting university-industry linkages in Ethiopia: relationship towards technological learning and innovation. National Quality Infrastructure Project. Addis Ababa.

Boateng, Fred Kofi (2020). Higher education systems and institutions, Ethiopia. In *Encyclopedia of International Higher Education Systems and Institutions*, Jung-Cheol Shin, Pedro Nuno Teixeira, eds. New York: Springer.

Boettiger, Sara, and Alan Bennet (2006). The Bayh-Dole Act: implications for developing countries. *IDEA, The Intellectual Property Law Review*, vol. 46, No. 2, pp. 261–81.

Bughin, Jacques, and others (2016). *Lions on the move II: Realizing the Potential of Africa's Economies*. McKinsey Global Institute.

Centobelli, Piera, and others (2019). Exploration and exploitation in the development of more entrepreneurial universities: A twisting learning path model of ambidexterity. *Technological Forecasting and Social Change*, vol. 141 (April), pp. 172–194.

Clark, Burton R. (1998). *Creating Entrepreneurial Universities: Organisational Pathways of Transformation*. Bingley, United Kingdom: Emerald Group Publishing Ltd.

_____(2001). The entrepreneurial university: new foundations for collegiality, autonomy, and achievement. *Journal of the Programme on Institutional Management in Higher Education: Higher Education Management*, vol. 13, No. 2 (July), pp. 9–24.

Colyvas, Jeannette, and others (2002). How do university inventions get into practice? *Management Science*, vol. 48, No. 1 (January), pp. 61–72.

Compagnucci, Lorenzo, and Fransesca Spigarelli (2020). The third mission of the university: a systematic literature review on potentials and constraints. *Technological Forecasting and Social Change*, vol. 161, Issue C.

Dalmarco, Gustavo, Willem Hulsink and Guilherme V. Blois (2018). Creating entrepreneurial universities in an emerging economy: evidence from Brazil. *Technological Forecasting and Social Change*, vol. 135 (October), pp. 99–111.

Davies, John L. (2001). The emergence of entrepreneurial cultures in European universities. *Journal of the Programme on Institutional Management in Higher Education: Higher Education Management*, vol. 13, No. 2, pp. 25–44.

Durban University of Technology (n.d.). Webpage. Available at www.dut.ac.za/.

_____(n.d.). Entrepreneurship. Available at www.dut.ac.za/entrepreneurship/.

_____(n.d.). Envision2030. Available at www.dut.ac.za/envision-2030/.

Duruflé, Gilles, Thomas Hellmann and Karen Wilson (2018). Catalysing entrepreneurship in and around universities. *Oxford Review of Economic Policy*, vol. 34, No. 4 (Winter), pp. 615–636.

Dzisi, Smile, and Franklin Odoom (2017). Entrepreneurship education and training in higher educational institutions in Ghana. *Journal of International Entrepreneurship,* vol. 15 (July), pp. 436–452.

Ethiopia (2003). Proclamation No. 351/2003. Higher Education Proclamation. Federal Negarit Gazeta of the Federal Democratic Republic of Ethiopia. Addis Ababa.

_____(2009). Proclamation No. 351/2003. Higher Education Proclamation. Federal Negarit Gazeta of the Federal Democratic Republic of Ethiopia. Addis Ababa.

_____(2019). Proclamation No. 1152/2019. Higher Education Proclamation. Federal Negarit Gazeta of the Federal Democratic Republic of Ethiopia. Addis Ababa.

Ethiopia, Federal Ministry of Education (2015). *Education Sector Development Programme V (ESDP V): 2015/16 – 2019/20 G.C: Programme Action Plan*. Addis Ababa.

Ethiopia, Ministry of Education (1994). Education and training policy. Addis Ababa.

_____(2018a). *Education Statistics Annual Abstract 2009 (2016/17)*. Addis Ababa.

_____(2018b). *Education Development Roadmap (2018–30): An integrated Executive Summary*. Education Strategy Center. Addis Ababa.

Ethiopia, Ministry of Science and Higher Education (2020). National science policy and strategy. Addis Ababa.

Ethiopia, Ministry of Science and Technology (2012). Science, technology and innovation policy. Addis Ababa.

_____(2013). Procedural directive for the linkage of education and training. Research Institutes and Industries, No. 3/2013. Addis Ababa.

Etzkowitz, Henry (1983). Entrepreneurial scientists and entrepreneurial universities in American academic science. *Minerva*, vol. 21.

_____(2013). Anatomy of the entrepreneurial university. *Social Science Information*, vol. 52, No. 3 (August), pp. 486–511.

_____(2016). The entrepreneurial university: vision and metrics. *Industry and Higher Education*, vol. 30, No. 2 (April), pp. 83–97.

Etzkowitz, Henry, and Loet Leydesdorff (2000). The dynamics of innovation: from national systems and "model 2" to a triple helix of university-industry-government relations. *Research Policy*, vol. 29, No. 2 (February), pp. 109–123.

Etzkowitz, Henry, and others (2000). The future of the university and the university of the future: evolution of ivory tower to entrepreneurial paradigm. *Regional Policy*, vol. 29, No. 2 (February), pp. 313–330.

Fabrizio, Kira (2006). The use of university research in firm innovation. In *Open Innovation: Researching a New Paradigm*, Henry Chesbrough, Wim Vanhaverbeke and Joel West, eds. Oxford: Oxford University Press.

Gebremeskel, Haftu Hindeya, and Kibrom Mengistu Feleke (2016). Exploring the context of Ethiopian higher education system using Clark's triangle of coordination. *Tertiary Education and Management,* vol. 22. No. 2 (March), pp. 99–120.

Gerba, Dugassa Tessema (2012). The context of entrepreneurship education in Ethiopian universities. *Management Research Review*, vol. 35, No. 3-4 (March), pp. 225–244.

Ghana (1993). National Council for Tertiary Education Act, 1993 (Act 454). Accra. 6 July.

_____(2000a). Ghana Education Trust Fund Act, 2000 (Act 581). Accra. 25 August.

_____(2000b). Protection Against Unfair Competition Act, 2000 (Act 589). Accra. 19 December.

_____(2003a). Patents Act, 2003 (Act 657). Accra. 31 December.

_____(2003b). Industrial Designs Act, 2003 (Act 660). Accra. 31 December.

_____(2004). Trade Marks Act, 2004 (Act 664). Accra. 29 January.

_____(2005). The Copyright Act, 2005 (Act 690). Accra. 17 May.

_____(2009). Ghana Education Act, 2008 (Act 778). Accra. 6 January.

_____(2020). Education Regulatory Bodies Act, 2020 (Act 1023). Accra. 26 August.

Ghana, Ministry of Education (2019). Ghana Tertiary Education Policy. Accra.

_____(n.d.). *Education Strategic Plan 2018–2030*. Accra.

Ghana, Ministry of Education, Youth and Sports (2004). White paper on the report of the education reform review committee. Accra.

Gibb, Allan, Gay Haskins and Ian Robertson (2013). Leading the entrepreneurial university: meeting the entrepreneurial development needs of higher education institutions. In *Universities in Change: Managing Higher Education Instit 2005utions in the Age of Globalisation*, 2013 Edition, Andreas Altmann and Bernd Ebersberger, eds. New York: Springer – Innovation, Technology, and Knowledge Management series. Pp. 9–45.

Guerrero, Maribel, and David Urbano (2012). The development of an entrepreneurial university. *The Journal of Technology Transfer*, vol. 37, pp. 43–74.

Guerrero, Maribel, James A. Cunningham and David Urbano (2015). Economic impact of entrepreneurial universities' activities: an exploratory study of the United Kingdom. *Research Policy*, vol. 44, No. 3 (April), pp. 748–764.

Gümüsay, Ali Aslan and Thomas Marc Bohné (2018). Individual and organizational inhibitors to the development of entrepreneurial competencies in universities. *Research Policy*, vol. 47, No. 2 (March), pp. 363–378.

Gunasekara, C. (2006). Reframing the role of universities in the development of regional innovation systems. *Journal of Technol Transfer,* vol. 31, No. 1.

Haramaya University (2016). *Haramaya University Strategic Plan (2015/16–2019/20): Based on Balanced Scorecard (BSC) Approach*. Haramaya, Oromia, Ethiopia.

Herrmann, K., and others (2008). Developing entrepreneurial graduates: putting entrepreneurship at the centre of higher education. London: Nesta.

Hoog, Stefan Op't, and Dimitra Skoumpopoulou (2019). Entrepreneurship education: comparative study of initiatives of two partner universities. *The Athens Journal of Education*, vol. 6, No. 4 (November), pp. 307–328.

Jones, Paul, and others (2013). Embedding enterprise: a business school undergraduate course with an enterprise focus. *Industry and Higher Education*, vol. 27, No. 3, pp. 205–215.

Jones, Paul, and others (2018). Entrepreneurship in Africa, part 2: entrepreneurial education and ecosystems. *Journal of Small Business and Enterprise Development*, vol. 25 No. 4 (August), pp. 550–553.

Kabongo, Jean D., and John O. Okpara (2010). Entrepreneurship education ins sub-Saharan African universities. *International Journal of Entrepreneurial Behavior and Research*, vol. 16, No. 4 (June), pp. 296–308.

Kannan, A.S. (2012). Entrepreneurial education in Ethiopian universities, current trends and gaps: the case of Dilla University. *International Journal of Management*, vol. 3 No. 3 (September–December), pp. 121–130.

Kirby, D.A. (2006). Creating entrepreneurial universities in the UK: applying entrepreneurship theory to practice. *Journal of Technol Transfer,* vol. 31.

Kitagawa, Fumi, Mabel Sánchez-Barrioluengo and Elvira Uyarra (2016). Third mission as institutional strategies: between isomorphic forces and heterogeneous pathways. *Sciences and Public Policy*, vol. 43, No. 6 (December), pp. 736–750.

Klofsten, Magnus, and others (2019). The entrepreneurial university as a driver for economic growth and social change: key strategic challenges. *Technological Forecasting and Social Change*, vol. 141 (April), pp. 149–158.

Labournet (2020). Beginners guide to B-BBEE. Available at www.labournetblog.com/post/2019/07/08/beginners-guide-to-b-bbee. Accessed on 10 June 2021.

Lackeus, Martin (2015). Entrepreneurship in education: what, why, when and how. Entrepreneurship 360 background paper. Paris: Local Economic and Employment Development Division, Organisation for Economic Co-operation and Development.

Laskowski, Nicole (2013). Definition: intrapreneur (intrapreneurship). Available at https://searchcio.techtarget.com/definition/intrapreneurs-intrapreneurship. Accessed on 17 May 2021.

Lebeau, Yann, and Ibrahim O. Oanda (2020). Higher education expansion and social inequalities in sub-Saharan Africa: conceptual and empirical perspective. United Nations Research Institute for Social Development, Working Paper, No. 2020–10. Geneva.

Lehmann, Erik E., and others (2020). The role of higher education for the development of entrepreneurial ecosystems. *European Journal of Higher Education*, vol. 10, No. 1 (March), pp. 1–9.

Markuerkiaga, Leire, Nekane Errasti and Juan Ignacio Igartua (2014). Success factors for managing an entrepreneurial university: developing an integrative framework. *Industry and Higher Education*, vol. 28, No. 4 (August), pp. 233–244.

Mazzarol, T. (2014). Growing and sustaining entrepreneurial ecosystems: what they are and the role of government policy. White Paper No. WP01-2014. Small Enterprise Association of Australia and New Zealand.

Melu, Anteneh (2016). Brief assessment of higher education governance in Ethiopia: reflection on the leap of the decade. *Journal of Higher Education in Africa*, vol. 14, No. 2, pp. 107–126.

Montobbio, Fabio (2009). Intellectual property rights and knowledge transfer from public research to industry in the US and Europe: which lessons for innovation systems in developing countries. In *The Economics of Intellectual Property: Suggestions for Further Research in Developing Countries and Countries with Economies in Transition*. Geneva: World Intellectual Property Organization, pp. 180–209.

Mudde, Huub. L.M., Dugassa Tessema Gerba and Alemfrie Derese Chekol (2015). *Entrepreneurship Education in Ethiopian Universities: Institutional assessment – Synthesis Report*. Netherlands: Maastricht School of Management.

Mudde, Huub L.M., and others (2019). Entrepreneurial change in government-led development: Ethiopian universities. *Higher Education, Skills and Work-based Learning*, vol. 9, No. 3 (July), pp. 387–402. https://doi.org/10.1108/HESWBL-07-2018-0073

Mulenga, Lloyd B., and others (2021). Prevalence of SARS-CoV-2 in six districts in Zambia in July, 2020: a cross-sectional cluster sample survey. *The Lancet*, vol. 9, No. 6 (June), E773–E781.

Musau, Zipporah (2017). Entrepreneurial universities: marrying scholarly research with business acumen – new trend releases the power of entrepreneurship. *Africa Renewal*. Available at www.un.org/africarenewal/magazine/special-edition-youth-2017/entrepreneurial-universities-marrying-scholarly-research.

Naidu, S. (2021). The impact of COVID-19: the conundrum of South Africa's socio-economic landscape. Available at www.accord.org.za/analysis/the-impact-of-COVID-19-the-conundrum-of-south-africas-socio-economic-landscape/.

Nelson Mandela University (2020a). *Vision 2030: Strategy*. Gqeberha, South Africa.

_____(2020b). *Annual Performance Plan 2021*. Gqeberha, South Africa.

_____(n.d.). Student Entrepreneurship Policy Framework. Available at https://entrepreneurship.mandela.ac.za/entrepreneurship/media/Store/documents/policy%20document/STUDENT-ETREPRENEURSHIP-POLICY-FRAMEWORK-(FINAL)_.pdf.

Nyadu-Addo, Ralph, and Mavis S.B. Mensah (2018). Entrepreneurship education in Ghana – the case of the KNUST entrepreneurship clinic. *Journal of Small Business and Enterprise Development*, vol. 25, No. 4 (August), pp. 573–590.

Organisation for Economic Co-operation and Development and European Commission (2012). *A Guiding Framework for Entrepreneurial Universities*. Available at www.oecd.org/site/cfecpr/EC-OECD%20Entrepreneurial%20Universities%20Framework.pdf.

Perkmann, Marcus, and others (2013). Academic engagement and commercialisation: a review of the literature on university-industry relations. *Research Policy*, vol. 42, No. 2 (March), pp. 423–442.

Pinheiro, Rómulo, and Bjørn Stensaker (2014). Designing the entrepreneurial university: the interpretation of a global idea. *Public Organization Review*, vol. 14, pp. 497–516.

Preprah, Augustine Awuah, and Adenuga Fabian Adekoya (2020). Entrepreneurship and economic growth in developing countries: evidence from Africa. *Business Strategy and Development*, vol. 3, No. 3 (September), pp. 388–494.

Pugh, Rhiannon, and others (2018). The entrepreneurial university and the region: what role for entrepreneurship departments? *European Planning Studies*, vol. 26, No. 9 (March), pp. 1835–1855.

Robb, Alicia, Alexandria Valerio and Brent Parton, eds. (2014). *Entrepreneurship Education and Training: Insights from Ghana, Kenya, and Mozambique*. Washington, D.C.: World Bank.

Rothaermel, Frank T., Shanti D. Agung and Lin Jiang (2007). University entrepreneurship: a taxonomy of the literature. *Industrial and Corporate Change*, vol. 16, No. 4 (August), pp. 691–791.

Ruswa, Anesu Sam (2019). Multi-dimensional student poverty at a South African university: a capabilities approach. Policy Brief. Available at www.ufs.ac.za/docs/librariesprovider34/default-document-library/anesu-policy-brief.pdf?sfvrsn=5c868921_0.

Sall, Ebrima, and Ibrahim Oanda (2014). Revitalising higher education for Africa's future. *Journal of Higher Education in Africa*: *Special Issue on Academic Freedom in Africa*, vol. 12, No. 2, pp. 95–108.

Sam, Chanphirun, and Peter van der Sijde (2014). Understanding the concept of entrepreneurial university from the perspective of higher education models. *Higher Education*, vol. 68, No. 6 (December), pp. 891–908.

Sampat, Bhaven N. (2006). Patenting and US academic research in the 20th Century: the world before and after Bayh-Dole. *Research Policy*, vol. 35, No. 6 (July), pp. 772–789.

Sánchez-Barrioluengo, Mabel, and Paul Benneworth (2019). Is the entrepreneurial university also regionally engaged? Analysing the influence of university's structural configuration on third mission performance. *Technological Forecasting and Social Change*, vol. 141 (April), pp. 206–218.

Sánchez-Barrioluengo, Mabel, Elvira Uyarra and Fumi Kitagawa (2019). Understanding the evolution of the entrepreneurial university: the case of English higher education institutions. *Higher Education Quarterly*, vol. 73, No. 4 (October), pp. 469–495.

Siegel, Donald S., and Mike Wright (2015). Academic entrepreneurship: time for a rethink? *British Journal of Management*, vol. 26, No. 4 (October), pp. 582–595.

South Africa (2020). The South African economic reconstruction and recovery plan: building a new economy. Available at www.gov.za/sites/default/files/gcis_documents/Economic%20Recovery%20Plan%20Publication_highlights.pdf

Sporn, Barbara (2001). Building adaptive universities: emerging organisational forms based on experiences of European and US universities. *Tertiary Education and Management*, vol, 7, No. 2, pp. 121–134.

Statistics South Africa (2021). Youth still find it difficult to secure jobs in South Africa. Available at www.statssa.gov.za/?p=14415. Accessed on 19 May 2021.

Stellenbosch University (2021). LaunchLab: demystifying entrepreneurism, 24 May. Available at: https://www.sun.ac.za/english/Lists/news/DispForm.aspx?ID=8272.

Steynvaart, Maryke (2020). Understanding graduate unemployment. *Print, Digital and Broadcast Youth Media (PDBY)*, 16 February.

Subotsky, George (1999) Alternatives to the entrepreneurial university: New modes of knowledge production in community service programs. *Higher Education*, vol. 38, No. 4 (December). pp 401–440.

Technology and Innovation Institute (2017). *Ethiopian National Survey of Research and Experimental Development 2016/17*. Addis Ababa.

Tessema, Kedir Assefa (2009). The unfolding trends and consequences of expanding higher education in Ethiopia: massive universities, massive challenges. *Higher Education Quarterly*, vol. 63, No. 1 (January), pp. 29–45.

Universities South Africa (2019). It might take a lot to create entrepreneurial universities, but it is feasible. Available at www.usaf.ac.za/wp-content/arc-news/entrepreneurial_universities.html.

Valerio, Alexandria, Brent Parton and Alicia Robb (2014). *Entrepreneurship Education and Training Programs around the World Dimensions for Success*. Washington, D.C.: World Bank.

Wilson, Karen (2008). Entrepreneurship education in Europe. In *Entrepreneurship and Higher Education*, chapter 5, Jonathan Potter, ed. Paris: Organisation for Economic Co-operation and Development.

Wong, Poh Kam, Yuen Ping Ho and Erkko Autio (2005). Entrepreneurship, innovation and economic growth: evidence from GEM data. *Small Business Economics*, vol. 24 (April), pp. 335–350.

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Annex.

The questionnaire to assess the development of entrepreneurial universities

Advancing entrepreneurial universities in Africa

Respondent details

Name:

Position:

Department/School:

Institution:

Country:

Telephone:

Fax:

Email:

Homepage: http://

Purpose

The questionnaire is designed to generate information and data to inform national and regional processes on the steps needed to support university investments, efforts and the time devoted to entrepreneurship. It is not designed to assess enterprising efforts (i.e., investment in commercial activities to generate more revenue for the institution) but rather *on how the institution is positioned to promote, nurture and drive entrepreneurship and business development in the region, country and/or internationally*.

The questionnaire looks at seven key areas: leadership and governance; organizational capacity, people and incentives; entrepreneurship development in teaching and learning; pathways for entrepreneurs; university-business/external relationships for knowledge exchange; the entrepreneurial university as an internationalized institution; and measuring the impact of the entrepreneurial university.

This questionnaire is based on the work undertaken by the European Commission and Organisation of Economic Co-operation and Development, which led to the development of *A Guiding Framework for Entrepreneurial Universities*. While there is no one-size-fits-all definition of an entrepreneurial university, they share many aspects, such as strong and independent leadership, a greater focus on research, a broad funding base, the presence of hard and soft entrepreneurship support infrastructure and a strong working relationship with industry in its teaching, research and business support. These characteristics, shown in the seven areas mentioned above, distinguish entrepreneurial universities from others that are not.

Confidentiality

All information provided will be reported in generic and aggregate terms only. This includes information related to the respondents and sources. The raw data shall be handled only by the staff authorized by both the national agency and ECA. However, to encourage the adoption of good

practices, policies and measures, cases judged as good practices may be shared with policymakers in a generalized form to facilitate learning. Please indicate or mark as "confidential" information on project description that you may wish to be kept confidential.

Organization of the survey questionnaire

This survey is divided into TWO sections. Please feel free to consult colleagues or other members at your institution.

Your honest assessment is highly recommended and valued. Thank you for your inputs.

Contacts

For additional information, please contact:
Mr Asfaw Yitna, ECA – yitna@un.org
Mr. Gedion Workneh, ECA – workneh@un.org

SECTION 1

Please indicate the extent (from 0 to 6) to which you agree that your university has the attribute outlined below, based on your extensive knowledge and understanding.

0	**Fully disagree**	The attribute *DOES NOT APPLY* at all or the measure *has not even been discussed.*
1	**Strongly Disagree**	Some general discussions have happened, but **no specific measure** has been defined or any practical step undertaken
2	**Disagree**	Measures have been discussed and broadly defined *but* have not been adopted or practiced.
3	**Neutral**	Measures are in place *but* only minimal implementation has taken place.
4	**Agree**	Measures applied with some good degree of success that you are proud of.
5	**Strongly agree**	Measures applied widely, for example, across the university and also with external linkages, yielding good results.
6	**Fully agree**	The university can be deemed a good practice or best case of an entrepreneurial university. Measures are fully integrated across all faculties; they are well known by all and/or very successful. There is significant engagement and linkage of, and recognition by external stakeholders

1. Leadership and governance

This section explores those factors that relate to the leadership and governance of a university. In order to develop an entrepreneurial culture in an institution, strong leadership and good governance are crucial. Many universities include the words "enterprise" and "entrepreneurship" in their mission statement; but this needs to be more than a reference. In this section, some of the important factors a university may consider to strengthen their entrepreneurial agenda are highlighted.

Statements	0	1	2	3	4	5	6
1.1. Entrepreneurship is clearly integrated as a major part of the university's mission and strategy.	☐	☐	☐	☐	☐	☐	☐
1.2. There is strong commitment at a high level of the university to implementing the entrepreneurial strategy.	☐	☐	☐	☐	☐	☐	☐

1.3. The university has a clear model for coordinating and integrating entrepreneurial activities at ALL levels across the university. ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.4. Faculties, departments and units have adequate autonomy to act on their entrepreneurial initiatives. ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.5. The university is active in developing initiatives and programmes that drive entrepreneurship development in the wider regional, social and community environment. ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.6. Faculties, departments and units are empowered to generate innovative ideas and seek ways to bring them to market without seeking the approval of senior leadership. ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.7. The university is a major provider of products and other innovations that have supported business development and/or improved the lives of people in the community. ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.8. The university is active in providing critical consultancy and advisory services on entrepreneurship issues in the wider regional, social and community environment. ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.9. The university is active in providing critical support services to its surrounding communities (e.g., health, engineering, agricultural services) ☐ ☐ ☐ ☐ ☐ ☐ ☐

1.10. The university's research and training programmes for supporting businesses and/or addressing challenges in the local community are well established and recognized by the community. ☐ ☐ ☐ ☐ ☐ ☐ ☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

2. Organizational capacity, people and incentives

Universities can be constrained by their own organizational structures and approaches, making it more difficult to carry out the types of entrepreneurial activities that support their strategic objectives. In this section, some of the key areas a university may look at if it wishes to minimize the organizational constraints to fulfilling its entrepreneurial agenda are highlighted. This includes creating a financial strategy, attracting and retaining the right people and incentivizing entrepreneurial behaviour in individuals.

Statements	0	1	2	3	4	5	6
2.1. The university has a sustainable financial strategy in place to support its entrepreneurial agenda.	☐	☐	☐	☐	☐	☐	☐
2.2. The university's entrepreneurial objectives are supported by a wide variety of internal and external funding sources/investment.	☐	☐	☐	☐	☐	☐	☐
2.3. The university has diverse mechanisms and channels to bring internal stakeholders (including management, staff and students) across levels and departments together to foster	☐	☐	☐	☐	☐	☐	☐

their involvement and relationships in line with its entrepreneurial agenda.

2.4. The university is open to recruiting practitioners with business/entrepreneurship experience to take up teaching, training and research positions. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.5. The university has diverse mechanisms and channels to bring female internal and/or external stakeholders together to foster their involvement and relationships in line with its entrepreneurial agenda. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.6. The university dedicates adequate investment to staff development to support its entrepreneurial agenda. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.7. There are adequate additional resources (e.g., budget, space and time) and clear rewards for staff who actively support and implement the university's entrepreneurial agenda. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.8. The university has adequate entrepreneurial support targeting female staff and external partners. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.9. Involvement in entrepreneurial activities is included as a key criterion in the performance appraisals and promotion of staff. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.10. There is adequate status and recognition given to other stakeholders (including alumni, entrepreneurs, individuals, etc.) who contribute to the university's entrepreneurial agenda. ☐ ☐ ☐ ☐ ☐ ☐ ☐

2.11. Interdisciplinary units and groups that support and/or undertake entrepreneurial activities are prioritized in the university system (including funding schemes, resource allocation, media coverage, etc.). ☐ ☐ ☐ ☐ ☐ ☐ ☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

3. Entrepreneurship development in teaching and learning

Universities are expanding their entrepreneurship and entrepreneurial education offer to the institution as a whole, including all staff and students. This section is focused on a number of areas in which entrepreneurial development can take place, reflecting the need for the organizational structure to support entrepreneurial development as well as provide the right tools to deliver education and training opportunities both internally and via the external environment.

Statements	0	1	2	3	4	5	6
3.1. The university is structured in such a way that strongly stimulates and supports the development of entrepreneurial mindsets and skills across the institution.	☐	☐	☐	☐	☐	☐	☐
3.2. Entrepreneurial training and development for staff takes place in ALL parts of the university.	☐	☐	☐	☐	☐	☐	☐

3.3. The university explicitly encourages staff in all departments to take an entrepreneurial approach to teaching, learning and research, promote diversity and encourage the creativity and innovation of students. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.4. The university strongly encourages and supports staff in creating new curricula related to entrepreneurship. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.5. The entrepreneurial behaviour of staff and students is strongly supported throughout the university experience, from creating awareness and stimulating ideas to development and implementation (pre-business and business start-up). ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.6. The university actively engages external stakeholders, including graduate entrepreneurs and business practitioners, in teaching, learning and research activities. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.7. The university actively encourages and invests in learning and teaching innovations (including technologies, techniques, medium, etc.) in entrepreneurship education. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.8. The university actively develops pedagogies that are focused on hands-on entrepreneurial activities and experiential/practice-based learning. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.9. The university actively delivers upskill/reskill entrepreneurship training for business and workforce in the community. ☐ ☐ ☐ ☐ ☐ ☐ ☐

3.10. Entrepreneurship curricula are regularly refreshed to incorporate new entrepreneurial/business knowledge, needs and trends. ☐ ☐ ☐ ☐ ☐ ☐ ☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

4. Pathways for entrepreneurs

This section looks at the university support for "entrepreneurs" in their career development or enterprising individuals on their pathway to becoming entrepreneurs.

Statements	0	1	2	3	4	5	6
4.1. The university actively raises awareness of the value and impact of developing entrepreneurial mindsets and skills among its staff and students, and encourages them to become entrepreneurial.	☐	☐	☐	☐	☐	☐	☐
4.2. The university has adequate entrepreneurial support targeting female students.	☐	☐	☐	☐	☐	☐	☐
4.3. The university provides adequate opportunities for its staff and students to experience and/or practice entrepreneurship.	☐	☐	☐	☐	☐	☐	☐

4.4. The university provides adequate support for its staff and students to turn entrepreneurial ideas into action. ☐ ☐ ☐ ☐ ☐ ☐ ☐

4.5. The university provides dedicated mentoring by entrepreneurs/business practitioners for its staff and students in their entrepreneurial activities. ☐ ☐ ☐ ☐ ☐ ☐ ☐

4.6. The university actively facilitates needed access to private financing/investment for potential staff and students to turn entrepreneurial ideas into action. ☐ ☐ ☐ ☐ ☐ ☐ ☐

4.7. The university provides needed access to business incubation facilities for its staff and students. ☐ ☐ ☐ ☐ ☐ ☐ ☐

4.8. The university has dedicated resources and programmes for creating student start-ups and/or academic spin-offs. ☐ ☐ ☐ ☐ ☐ ☐ ☐

4.9. The university has clear systems to help its staff and students to protect their innovations and other intellectual properties. ☐ ☐ ☐ ☐ ☐ ☐ ☐

4.10. The university has clear systems to enable its staff and students to commercialize innovations. ☐ ☐ ☐ ☐ ☐ ☐ ☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

5. University-business/external relationships for knowledge exchange

The active involvement of a range of stakeholders contributes to creating value for the university and society. Building and sustaining relationships with key partners and collaborators (e.g., public sector, regions, businesses, alumni, professional bodies) is essential to achieving the full potential of a university in entrepreneurship, research, teaching and other third-mission activities.

Statements	0	1	2	3	4	5	6
5.1. The university is strongly committed to building **local** knowledge exchanges and collaborative partnerships with industry, society and the public sector.	☐	☐	☐	☐	☐	☐	☐
5.2. The university is strongly committed to building **international** knowledge exchanges and collaborative partnerships with industry, society and the public sector.	☐	☐	☐	☐	☐	☐	☐
5.3. The university has strong links and partnerships with external incubators, science parks and similar platforms.	☐	☐	☐	☐	☐	☐	☐
5.4. The university has dedicated channels and schemes to attract prospective partners in industry, society and the public sector to collaborate with its staff and students.	☐	☐	☐	☐	☐	☐	☐

5.5. The university is open to providing access to its facilities and services for external stakeholders to undertake entrepreneurial activities.	☐	☐	☐	☐	☐	☐	☐
5.6. The university has a clear system through which external stakeholders could exploit the university's intellectual properties (e.g., licences, patents, technologies) in entrepreneurial activities.	☐	☐	☐	☐	☐	☐	☐
5.7. The university has strong links with industry to provide short-term placements, internships and industry project opportunities for its students.	☐	☐	☐	☐	☐	☐	☐
5.8. The university plays a key role in informing or advising the entrepreneurship and enterprise-related public policy of the community.	☐	☐	☐	☐	☐	☐	☐
5.9. The university is active in undertaking contract research commissioned by private and public sector actors.	☐	☐	☐	☐	☐	☐	☐
5.10. The university regularly holds public lectures and events that bring together academia, industry and public sectors for knowledge exchange about local and/or global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance.	☐	☐	☐	☐	☐	☐	☐
5.11. The university works closely with professional institutions to ensure/certify the professional quality and standards of its programmes and graduates.	☐	☐	☐	☐	☐	☐	☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

6. The entrepreneurial university as an international institution

An international perspective at all levels has been identified as one of the characteristics of an entrepreneurial university. As internationalization is increasingly integrated into strategic processes, it becomes essential for universities to be able to make informed decisions on institutional directions, as well as to assess and enhance performance according to different objectives over a wide range of international activities. It is not possible for a university to be entrepreneurial without being international, but the university can be international without being entrepreneurial.

This section of the Guiding Framework provides a number of statements that reflect the influence of the international environment on the entrepreneurial aspects of teaching, research, talent development, new opportunities and culture.

Statements	0	1	2	3	4	5	6
6.1. Internationalization is a key part of the university's entrepreneurial strategy	☐	☐	☐	☐	☐	☐	☐
6.2. The university explicitly encourages and supports the international mobility (e.g., exchanges, volunteering,	☐	☐	☐	☐	☐	☐	☐

secondments, fellowships) of its staff and students (including PhD students).

6.3. The university actively attracts and recruits international staff, visiting fellows and delegations (including teaching, research and PhDs). ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.4. The university actively seeks to raise its international profile and ranking. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.5. The university clearly incorporates the objective of internationalization in its learning and teaching strategies. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.6. The university explicitly encourages and supports education and research initiatives that address global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.7. The university actively seeks to establish new education and research international partnerships and/or deepen existing ones. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.8. The university actively promotes and showcases its international activities and achievements through diverse channels. ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.9. The university actively pursues transnational higher education opportunities (e.g., international branch campuses, distance learning and/or joint programmes with international partners). ☐ ☐ ☐ ☐ ☐ ☐ ☐

6.10. The university and its departments and faculties actively participate in international education and research networks. ☐ ☐ ☐ ☐ ☐ ☐ ☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

7. Measuring the impact of the entrepreneurial university

There are many different types of impact a university may seek to have, ranging from the local to the global. The impacts affect both internal stakeholders (students/graduates, staff) and external stakeholders (local businesses, organizations and whole communities). Impact measurement, relating to graduate entrepreneurship, retaining talent, local economic development or the impacts of the broader entrepreneurial strategy, is the focus here.

Statements	0	1	2	3	4	5	6
7.1. The university has put in place clear guidelines and systems to record, measure and review the outcomes of its entrepreneurial strategy on a regular basis.	☐	☐	☐	☐	☐	☐	☐
7.2. The university regularly assesses the impact of its entrepreneurial strategy on the entrepreneurship development of its staff and students across the institution.	☐	☐	☐	☐	☐	☐	☐
7.3. The university regularly assesses the level of engagement of all faculties and departments in entrepreneurship teaching, research and entrepreneurial activities across the institution.	☐	☐	☐	☐	☐	☐	☐

7.4. The university regularly assesses the impact of entrepreneurship teaching and learning on participants' entrepreneurial orientation and skills development (e.g., changes in participants' motivation to undertake entrepreneurial activities, the level of competence in the skills gained). ☐ ☐ ☐ ☐ ☐ ☐ ☐

7.5. The university regularly assesses the impact of its entrepreneurship research on producing knowledge of use to policy, business practice, scholarly activity and social life. ☐ ☐ ☐ ☐ ☐ ☐ ☐

7.6. The university carries out regular monitoring and evaluation of the outcomes of its knowledge exchange activities with external stakeholders (e.g., in terms of start-ups and spin-offs, patents, new research ideas, new partnerships). ☐ ☐ ☐ ☐ ☐ ☐ ☐

7.7. The university carries out regular monitoring and evaluation of the impact of its start-up and enterprise support (e.g., number of users, satisfaction of users, new support introduced, number of start-up ideas realized, number of new ventures). ☐ ☐ ☐ ☐ ☐ ☐ ☐

7.8. The university regularly measures and reviews the impact of its entrepreneurial initiatives and programmes on the economic development of the community and region. ☐ ☐ ☐ ☐ ☐ ☐ ☐

7.9. The university regularly publishes and shares assessment results on the impact of its entrepreneurial activities and outputs on internal and external stakeholders. ☐ ☐ ☐ ☐ ☐ ☐ ☐

7.10. The university engages both internal and external stakeholders in reviewing its entrepreneurial agenda and its outcomes. ☐ ☐ ☐ ☐ ☐ ☐ ☐

Give a brief description of examples of measures, steps taken or support and the impact (not more than 250 words)

SECTION 2

8. **Please indicate whether or not (Yes/No) the university has the mechanisms mentioned below. If you are not sure or do not know, please select "Not sure".**

8.1. **University mission and strategy**

Please indicate whether the below strategic area…	1 is *explicitly* included in the university's mission statement.			2 has a specific published implementation plan.		
	Yes	No	Not sure	Yes	No	Not sure
a. Entrepreneurial learning and teaching	☐	☐	☐	☐	☐	☐
b. Research on entrepreneurship	☐	☐	☐	☐	☐	☐
c. Intellectual property (including patents, licences, innovations, etc.) generation	☐	☐	☐	☐	☐	☐
d. Knowledge exchange and partnership	☐	☐	☐	☐	☐	☐
e. Technology transfer	☐	☐	☐	☐	☐	☐
f. Commercialization of research outputs/innovations	☐	☐	☐	☐	☐	☐
g. Business start-ups/academic spin-offs	☐	☐	☐	☐	☐	☐
h. Incubation	☐	☐	☐	☐	☐	☐
i. Internationalization of the university	☐	☐	☐	☐	☐	☐
j. Engagement in the community/regional economic and social development	☐	☐	☐	☐	☐	☐
k. Solutions to global challenges, such as climate change, security, energy and water efficiency, ageing and antibiotic resistance.	☐	☐	☐	☐	☐	☐

Give a brief description or links to the respective documents (Not more than 250 words)

8.2. **Availability of entrepreneurship support structure, services and programmes**

The university has…	Yes	No	Not sure
a. member(s) with entrepreneurial/business experience in its board of directors or university council.	☐	☐	☐
b. a central unit/team designated to coordinate entrepreneurial activities across the institution.	☐	☐	☐
c. a high-level leadership position (e.g., dean/director/chair of entrepreneurship) assigned to oversee the implementation of its entrepreneurial strategy.	☐	☐	☐
d. specialized units to coordinate individual entrepreneurial activities (e.g., technology transfer offices, knowledge exchange centres, industry liaison units, student enterprise development support units).	☐	☐	☐

e. a designated unit/team (e.g., alumni office and/or international office) to liaison and manage external relationships with international partners and associates. ☐ ☐ ☐

f. a designated unit/team to manage intellectual property issues (e.g., patents, non-disclosure agreements, other contractual agreements) of internal knowledge and innovations produced. ☐ ☐ ☐

g. a central quality assurance unit/team to review the quality of the entrepreneurial activities of the university. ☐ ☐ ☐

h. shared facilities for research and teaching across faculties and/or departments for exploiting internal knowledge. ☐ ☐ ☐

i. programmes/ initiatives to bring successful private sector based innovators and entrepreneurs to become involved in/support teaching and research. ☐ ☐ ☐

j. specific initiatives that promote and support female staff and students specifically to undertake entrepreneurial activities. ☐ ☐ ☐

k. seasoned and respected business leader(s) to serve as entrepreneurs-in-residence. ☐ ☐ ☐

l. extracurricular and/or non-credit activities and events on entrepreneurship topics delivered by entrepreneurs and business practitioners. ☐ ☐ ☐

m. staff development programmes focusing on entrepreneurial skills, knowledge and techniques for learning and teaching. ☐ ☐ ☐

n. incentive programmes in place to recognize and/or award (e.g., cash prizes, awards, certificates, paid study and development leave) successful entrepreneurial initiatives by staff and students. ☐ ☐ ☐

o. recognition and awards for outstanding external stakeholders, partners and/or alumni who actively engage in and/or contribute to entrepreneurship promotion. ☐ ☐ ☐

p. a consultation panel of external stakeholders (e.g., entrepreneurs, industry experts) to review its entrepreneurship-related programmes and projects. ☐ ☐ ☐

q. new entrepreneurship-related programmes and courses introduced in the last three years across the university. ☐ ☐ ☐

r. student international mobility programmes (e.g., international exchange, internship and/or volunteering programmes). ☐ ☐ ☐

s. staff international mobility programmes (e.g., international visiting scholarships, secondment to foreign institutions). ☐ ☐ ☐

t. joint degrees and/or research programmes with international partners. ☐ ☐ ☐

u. joint research centres with international partners. ☐ ☐ ☐

v. designated channels (e.g., agents, offices) to recruit international staff and students. ☐ ☐ ☐

w. designated public channels (e.g., printed or online) to disseminate entrepreneurship-related information (e.g., events, outputs, impact) about the university. ☐ ☐ ☐

Give a brief description of examples or links to materials (not more than 250 words)

8.3. Budgeting and financing

8.3.1. **The proportion of the *university budget* allocated specifically for the below activities *has grown in the past three years*:**	Yes, it has grown	No, it has not grown	No separate budget allocated	No information/not sure
a. (direct) entrepreneurial activities	☐	☐	☐	☐
b. entrepreneurship programmes	☐	☐	☐	☐
c. entrepreneurial support facilities and services	☐	☐	☐	☐
d. internationalization activities	☐	☐	☐	☐
e. knowledge exchange and engagement activities with external parties	☐	☐	☐	☐
f. entrepreneurial skills training and development of staff	☐	☐	☐	☐

8.3.2. **Below funding for implementing the entrepreneurial strategy of the university *has grown in the past three years*:**	Yes, it has grown	No, it has not grown	No funding from this source at all	No information/not sure
g. Reinvestment of entrepreneurial incomes of the university	☐	☐	☐	☐
h. Domestic public funding	☐	☐	☐	☐
i. Domestic private funding	☐	☐	☐	☐
j. Foreign public funding	☐	☐	☐	☐
k. Foreign private funding	☐	☐	☐	☐
l. Alumni funding/donations	☐	☐	☐	☐
m. Charity/trust funding	☐	☐	☐	☐

Provide any additional comments and examples here (not more than 500 words)

End of survey

Thank you for your time!