

1. Introduction: the role of entrepreneurial universities in society

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INTRODUCTION

Universities are increasingly becoming more entrepreneurial in their outlook and the way they integrate into society. This comes from the competitive pressures universities are facing in the global economy. More emphasis is being placed on the knowledge and service economies, which is impacting upon how universities are seen in communities. In the past universities were viewed more as teaching institutions, but this has changed, with research and development also being emphasized in terms of regional competitiveness. Therefore, the role of universities has adapted to be more entrepreneurial, as there are multiple stakeholder considerations.

Local, state and federal governments are interested in universities because of the role they play in economic growth and social cohesion. However, the different levels of government are interested in universities in different ways depending on their goals and objectives. Local governments, particularly those around the geographical area of a university, are interested in how the university contributes to the living conditions of citizens in an area. This means that housing, recreational and tourism considerations are important for local governments which gain monetary and reputational benefits from universities. At the state level there are similar considerations but there is a more group mentality on how universities are managed. Thus, there is competition amongst universities at the state level in terms of rankings and student income. At the federal or country level universities offer an indicator of the educational levels or capabilities within the global economy.

Formica (2002: 167) states that entrepreneurial universities 'embed entrepreneurship in academic culture in order to achieve economic returns from the knowledge generated through research projects, empowered

teams of teachers, students and business people, face-to-face and electronic relationships, and networked enterprises emerging from their spin-off activity'. The goal of entrepreneurial universities is to provide an environment that promotes risk taking and innovative activity. The key feature of entrepreneurial universities is to explore new ideas by utilizing the curiosity about potential business opportunities.

There is more pressure on universities to transform themselves to integrate new technology and business practices. In order to propel students into the new economic landscape, universities are incorporating more entrepreneurial initiatives on campus. This forms part of the changing academic landscape that incorporates a more interactive style of teaching and research (Ferreira et al., 2016). Universities need to integrate entrepreneurial ideas and beliefs into their organizational structures (Clark, 1998). This is a complex process involving testing and reformulating suggestions about entrepreneurial practices (Ratten and Ratten, 2007). To do this the ideas need to be worked out and incorporated in the university. Often a willingness to change is part of this process, as it provides a way to embrace new behaviours (Suseno and Ratten, 2007). By unifying organizational members under the vision of being entrepreneurial they can work together in a progressive way. Zhou and Peng (2008: 638) define an entrepreneurial university as 'the university that strongly influences the regional development of industries as well as economic growth through high-tech entrepreneurship based on strong research, technology transfer and entrepreneurship capability'. This definition is adopted in this chapter, as it focuses on a holistic view of entrepreneurial universities and the place they have in society.

This chapter is structured as follows. First, the development of the term 'entrepreneurial universities' in the literature is discussed. Second, the important role universities have in society is discussed with reference to the increased integration of entrepreneurship in educational systems. Third, the growing influence of technology and knowledge transfer at universities is stated. Next, community interaction and entrepreneurial universities is discussed. The chapter then provides an overview of chapters in the book. A final section draws conclusions.

ENTREPRENEURIAL UNIVERSITIES

Entrepreneurial universities can include a range of activities, from licensing and patenting agreements to the creation of new companies (Siegel et al., 2007). There has been a shift in the way entrepreneurship is understood at universities, with a flurry of cross-disciplinary programmes being started

around entrepreneurship. Traditionally entrepreneurship was considered in terms of the monetary income a university received from outside business activities that mostly arose from scientific discoveries. However, this conceptualization of entrepreneurship has changed, to include partnership arrangements with other education providers and housing arrangements on campuses. This diversity in entrepreneurship is reflected in the building and construction going on at universities.

Previously universities would focus on their onsite students and visitors, but with information technology advancing there has been an increase in online courses. Thus, the branding of universities has changed to suit the market needs. There has also been related merchandise using the university brand that is most evident in North American universities, particularly those with well-known sports teams. The changing nature of universities has meant that there has been some debate about how to encourage entrepreneurship at universities, whilst regulating it. This has resulted in informal technology transfer occurring, with university employees working with industry. Link et al. (2007) suggests that academics are motivated to engage in informal technology transfer due to potential monetary gains. Whilst linking industry to university research is important, there have been some people using these connections as a way to avoid disclosing potentially lucrative arrangements.

Heinonen and Hytti (2010) state that there is an academic revolution in the changing of universities into socio-economically engaged institutions. Thus, the modification has resulted in a dynamic interaction of universities in terms of their teaching, research and service. There is more awareness of the additional services a university offers to society, such as land for leisure activity and being a source of knowledge dissemination. In addition, there has been a change in the way entrepreneurship is taught at universities: previously this was only available at business schools, but it is now being embedded in other faculties. This has been a source of irritation for many entrepreneurship scholars who view entrepreneurship as a discipline similar to that of engineering or medicine that needs to have academically qualified professionals teaching the subject. However, universities have increased the use of qualified entrepreneurship scholars by promoting interdisciplinary subjects that link with business schools.

The rise of entrepreneurship at universities is timely, as it coincides with growing interest in solving problems in creative ways. Heinonen and Hytti (2010: 283) state that entrepreneurial universities focus on 'the close collaboration between academia, industry and government, and on the contribution of tertiary level education to society and the economy'. 'Entrepreneurship' at universities is a buzzword that is increasing in popularity due to its linkage with innovation and creativity. This is due to

universities being integrated in the social fabric of their community. The global economic landscape has placed more emphasis on entrepreneurship, which universities have capitalized on by promoting more entrepreneurial activities.

Gianiodis et al. (2016: 610) state that 'while an entrepreneurial university facilitates innovation and regional economic benefits, it also enhances scientists' reputation'. This stems from increased opportunities made available to scientists working for an entrepreneurial university. Universities produce market-relevant knowledge that helps to fill existing gaps in the marketplace. Part of the process for knowledge creation is innovation, which enables wealth creation. Martin and Turner (2010: 274) state that 'innovation is currently seen as the remedy for a range of ills, not only for economic development, but also societal issues'. Thus, innovation provides a way for the entrepreneurial university to achieve its goals and objectives within society.

Sporn (2001) highlights how efficiency and effectiveness are being encouraged through entrepreneurship at universities. There are different forms of entrepreneurship at universities that focus on interaction with student body communities through alumni and fundraising initiatives. Sporn (2001) suggests there are several ways to build more adaptive universities. First, the environment needs to be responsive to change. This can occur by placing more emphasis on resource allocation to ensure adequate funding for entrepreneurship projects. Second, the missions and goals need to focus on entrepreneurship. To do this it is useful to reward actions that are in alignment with an entrepreneurial culture at the university. There needs to be the use of entrepreneurial language in the mission statement as a way to signal to the community that the university values innovative thinking. Third, the culture needs to take an entrepreneurial approach to life on campuses. This can be exemplified by new processes that shorten product life cycle times in terms of getting ideas into the marketplace. Fourth, the structure of the university needs to be more conducive to cross-disciplinary collaboration. This might involve more of a matrix structure in which people can discuss ideas at any level of the organization. Fifth, management needs to focus on entrepreneurial decision making. This can include the use of information technology to harness the resource potential of ideas. Sixth, governance mechanisms that respond to decisions in a timely manner can help to facilitate the flow of ideas. This is important to engaging with different stakeholders in a productive manner. Seventh, leadership needs to be committed to the process of adaptation. This can include communicating new thought processes and standards of behaviour.

Universities are important parts of the knowledge economy and are trying to be more entrepreneurial in outlook. To do this they are focusing

on having an entrepreneurial management style that encourages interaction with the environment. There is a vast amount of research on entrepreneurial universities, due to their educational and business role in society. However, there is a need for more research on the changing nature of entrepreneurial universities, particularly from an interdisciplinary perspective, which is the purpose of this book.

Entrepreneurial universities can be explained as a way to stimulate engagement with industry through strengthening the commercialization of innovation. Thus, it is important to understand the contextual factors influencing the success of entrepreneurial universities. Universities are changing their organizational structure to more hybrid forms that can interact with new technology innovation. More universities have tried to emulate Stanford by focusing on entrepreneurship. This has enabled the status of universities that associate with entrepreneurship to be valued as more prestigious. To facilitate entrepreneurship there needs to be the use of networks as a way to coordinate the flow of resources. This can enable the use of entrepreneurial capabilities to disseminate important information and knowledge.

The traditional goal of universities was to disseminate knowledge to the global community. This occurred through university and industry engagement that often centred on research exchange. Entrepreneurial universities can renovate economies by promoting leading-edge arts, science and technology research (Etzkowitz, 2010). Universities have become more entrepreneurial internally with their processes and collaborative efforts, but also through external partnerships. This change in orientation towards entrepreneurship has enabled more collaborative initiatives around business development.

CHANGING ROLE OF UNIVERSITIES IN SOCIETY

Universities are supporting more proactive and engaged responses to solve problems or help society. This involves universities collaborating with a range of entities in a way that they have not done previously. To facilitate entrepreneurship there needs to be an organizational culture at universities that is flexible and open to change. Disseminating knowledge helps in evaluating the reality of moving forward with certain innovations. To encourage more entrepreneurship, universities are marketing themselves as sources of knowledge. This signal to the market changes past perceptions of universities as bureaucratic structures resistant to change.

Many universities are public universities funded by governments, but there has been a change towards more self-funded programmes and

initiatives in education. This has resulted in universities looking for ways to gain revenue and be less reliant on government funding. To achieve this, public–private partnerships that combine the use of university resources with those of private businesses are being encouraged. This helps to increase market efficiency at universities, but there has been a debate about how to do this whilst maintaining the reputation of universities. Universities are increasingly trying to integrate views from industry in their programmes in order to maintain their market competitiveness.

Jessop (2017) discusses how the increased interest in entrepreneurial universities is a result of the trend towards capitalization, commercialization and financialization. Universities are part of their regional innovation systems, due to the way they disseminate knowledge and contribute to its development. Brown (2016) suggests that universities are good for business, but also good instigators of business creation. This is due to universities playing an important role in national and global innovation policy through the impact they have on knowledge systems.

There has been a process of academic capitalism that has changed the way universities are viewed. Universities play an important role in entrepreneurial ecosystems by encouraging networks and the sharing of information. Some universities have focused on visionary policies that aim to solve future needs. Brown (2016: 190) states that ‘entrepreneurial ecosystems depict the actors (for example, entrepreneurs, universities, business incubators) and inter-relationships (links between entrepreneurs and venture capitalists, university–industry linkages) which shape the nature of regional entrepreneurship’. An example is the Yale endowment fund, which substantially increased due to investment returns and increased integration of technology initiatives in partnership with commercial entities.

D’Este and Perkmann (2011: 318) state that ‘rather than concentrating on “blue-skies” research, academics are seen increasingly to be eager to bridge the worlds of science and technology’. This involves a sense of ambidexterity, in being able to do research but then commercialize it. Academic entrepreneurs are able to combine multiple skills that enable a better way to access market potential. This can be conducted through disseminating knowledge in a way that provides a gain to the university. The convergence of both research and practice is an important way in which universities contribute to the economy. There is a hybrid nature to the way research outputs are communicated to communities, as some knowledge will apply to academics and some to practitioners. In addition, there are more incentives for universities to engage with their communities in an entrepreneurial manner. This involves providing personnel exchange between academia and industry to enable knowledge dissemination.

Advocates for entrepreneurial universities view them as an important

way to harness the business potential of knowledge coming from academic partnerships. Universities are increasing their ambitions to be the producers and disseminators of knowledge in the global economy. This involves taking ownership of the way knowledge is utilized in a university setting. D'Este and Perkmann (2011) view entrepreneurial science as using scientific knowledge in an innovative way, normally involving business applications.

Universities are essentially knowledge businesses, as they manage information in a productive manner. The arrangements made for facilitating knowledge exchange involve universities working with the community in a collaborative way. This can involve interaction amongst different entities of the university to advise on the potential of ideas. Hence, knowledge can accrue over a long time period, and it evolves based on societal demand. In order to evaluate risk there should be an understanding about how knowledge might be used.

In entrepreneurial universities, people are active participants in the ideation process that results in business creation. The logic of entrepreneurship in universities stems from the ability of knowledge to make a difference to society. Moreover, there are practical considerations deriving from the ability of people to focus on entrepreneurship. These include communicating research findings to another setting, thereby further facilitating knowledge dissemination. This enables the public to gain information about scientific discoveries in a transparent way. In order to encourage new behaviours, individuals need to have academic freedom to pursue ideas. This involves focusing on the overall benefit of an idea based on an evaluation of its potential. Thus, knowledge can undergo a life cycle whereby it is generated, then disseminated, and the comments fed back into further innovation. This means there needs to be information communicated about how to reach out to the community in order to provide more improvements.

TECHNOLOGY AND KNOWLEDGE TRANSFER AT UNIVERSITIES

Technology can be transferred at universities through human capital, licences and research (Brown, 2016). In addition, the spin-off firms from technology invented at universities have been a major source of commercialization. These spin-offs are sometimes bought by large companies as a way to gain access to cutting-edge research. Successful spin-off inventions from university technology transfer include Gardasil, a vaccine for cervical cancer that was developed at the University of Queensland, Australia. This vaccine has been a source of large royalty payments to the university.

There are also student start-ups at universities that encourage new ideas to be commercialized.

Gur et al. (2017: 1) states that an “entrepreneurial university” is the third mission attached to the higher education institutions in addition to their role in research and education’. This is due to universities being part of regional innovation systems diffusing innovation within a region by encouraging collaboration. Universities play a role in engendering entrepreneurship within regional innovation systems. Policy decisions are often made from knowledge originating from universities and related institutions.

More universities are focusing on their position in the international economy for competitiveness reasons. There has been a growing popularity of entrepreneurial universities as a way to combine private and public initiatives. In the global economy there is a need to spread knowledge rapidly, due to its role in knowledge-intensive industries. Due to the knowledge spillover effects universities have on individual countries, it is important to flag up universities’ path-breaking teaching, research and service activities. This is due to universities being primarily concerned with the generation and dissemination of knowledge.

Universities are a source of innovation networks due to their ability to disseminate information. However, there have been criticisms of universities for being too remote and not in touch with the business community. This perception has started to change in the marketplace, with more effort by universities to engage in their community. Kirby (2006) suggests that there are a number of strategic actions that universities can promote to encourage entrepreneurship. The most important way is through encouragement and support. This helps to build an entrepreneurial ecosystem at universities that encourages innovation and risk taking activity. There is ‘hard’ support that is tangible and can be measured more easily than ‘soft’ support. Hard support includes computers, buildings and infrastructure that facilitate entrepreneurship. There has been a trend towards more science parks and incubators that can teach people how to be entrepreneurs.

Soft support involves intangible help such as training and mentoring that is needed for entrepreneurship. Often the soft support is utilized in conjunction with hard support as a way to facilitate and maintain business ventures. Endorsements in the form of senior university staff being engaged in entrepreneurship are useful. This helps to endorse entrepreneurial behaviour as being important at universities. Incorporation involves starting entrepreneurship programmes at the university as a way to foster entrepreneurial activity. Implementation refers to setting targets about the number and range of entrepreneurship initiatives occurring at the university. These can be communicated through marketing and

information dissemination methods. Promotion refers to advertising about entrepreneurship that can include rewards and recognition. Business plan competitions or start-up days are ways in which universities can promote the entrepreneurship occurring at their universities. Organization means facilitating a cross-disciplinary research and teaching initiative on entrepreneurship. These different types of functions of entrepreneurial universities are part of the way they interact with the community.

COMMUNITY INTERACTION AND ENTREPRENEURIAL UNIVERSITIES

Entrepreneurial universities are a way to encourage organized interaction amongst members of a community in order to come up with novel ideas. This contrasts with the previous view of universities as being interventionist and autocratic in decision making processes. Entrepreneurship is a dynamic process and there needs to be awareness in the marketplace about how it develops. Some see entrepreneurship as being linked to a certain individual or maverick, whilst others view it as a collaborative project. Thus, it is becoming more generally accepted that a supportive environment is needed for entrepreneurship as a way to provide a trigger for innovative ideas. This helps to create synergistic relationships that advance current thinking and provide ways to grow the economy.

Entrepreneurial universities are anchor institutions that have mutual interdependencies with other members of a community. The presence of entrepreneurship at a university is viewed as a positive way to engage in the ideation process. Universities are at the heart of geographic networks due to their magnetic ability to attract talented individuals and companies. This helps to develop a source of intellectual capital for innovation that can lead to the creation of new business ideas. In addition, universities have a particular benefit to knowledge, service and manufacturing industries due to the spillover effects of information disseminated from their campuses.

Kirby (2006) suggests there are seven main reasons why universities have not been considered as entrepreneurial. First, the impersonal nature of relationships means that there can be a lack of communication amongst people at universities. This impacts upon the ability of people to have conversations about ideas. Second, the hierarchical structure means that it is hard to make quick decisions. This limits the ability to be responsive to market needs. Instead of quickly reacting to opportunities, there can be many levels of approval needed to make things happen at universities. Third, there is a need to adhere to rules and procedures, which slows the time taken to make decisions. Fourth, there is a sense of conservatism

that focuses on maintaining the status quo. This is reflected in the types of people employed at universities and their willingness to engage with outsiders. Part of this is the organizational culture existing at universities that has tended to limit risk taking. Fifth, the need for immediate results has decreased the ability of universities to focus on long-term opportunities. This means that strategic decisions requiring long-term investment are not made. Sixth, the lack of entrepreneurial talent means that the people employed by universities are unwilling to change. This deters innovation and proactive thinking about future trends. Seventh, there are inappropriate compensation methods in terms of rewarding entrepreneurship.

Due to the increased automation of industries many of the jobs done now will not be available in the future. Hence, universities play a key role in educating and training people for future work positions. A difficult challenge for universities is how to encourage entrepreneurship but at the same time maintain high economic standards. Culkin (2016: 11) states that there is ‘potential for universities to play a thought leadership role in shaping the development of skills in their regional economy’. This is important given the changing nature of the labour market and the increased need for competitiveness in the global economy. This has resulted in changing views of curriculum and assessment at universities. More assignments and experiential forms of assessment are being utilized as a way to foster real-life problem solving. This is a break with past practices of exams and assessment that encouraged rote learning.

Entrepreneurship provides a way to prepare students for the future by providing them with practical skills. Entrepreneurial universities have an opportunity to encourage progressive thinking in a supportive environment. This enables the embracing of innovative education and research strategies that lead to scientific discoveries. In order to move society forward there needs to be an acknowledgement of the transformative role of education. More entrepreneurial leaders are required to do this by shifting the way innovation is viewed in society.

OVERVIEW OF CHAPTERS

Chapter 2 titled ‘The role of university–business collaboration in entrepreneurship education programmes’ by Ana D. Daniel, Andreia Vitória and Mariana Pita discusses the importance of entrepreneurial communities. The chapter highlights the role of impactful teaching methodologies in promoting industry engagement. This is an important consideration for non-business students who can learn about entrepreneurship through experimental learning methods.

Chapter 3 titled 'Entrepreneurial university practices in Brazil under the lens of qualitative and quantitative research' by Carla Marques, Vitor Braga, João J. Ferreira and Moses Rodrigues discusses entrepreneurship education in an emerging-country context. As most research about entrepreneurial universities focuses on developed countries, it is helpful to take into account emerging economies like Brazil.

Chapter 4 titled 'A systemic approach for universities in the knowledge-based society: a qualitative study' by Ademar Schmitz, Gertrudes A. Dandolini, João A. de Souza, Maribel Guerrero and David Urbano focuses on the role of knowledge for entrepreneurial universities. The chapter discusses the role of universities as organizations in disseminating knowledge. This is crucial in the competitive global landscape that emphasizes the importance of knowledge.

Chapter 5 titled 'Entrepreneurialism in a London university: a case illustration' by Nnamdi O. Madichie, Ayantunji Gbadamosi and Sonny Nwankwo discusses the way in which a university has become entrepreneurial. The chapter provides a case study of a marketing course in terms of its entrepreneurial orientation.

Chapter 6 titled 'The level of competence of young researchers and the knowledge-based economy: the challenges of doctoral education in Poland' by Urszula Wiśniewska and Jacek Lewicki focuses on the importance of educating young people.

Chapter 7 titled 'HEInnovate: facilitating change in higher education' by Andrea-Rosalinde Hofer and Gabi Kaffka discusses the role of education in leading to transformational change. Increasingly, higher education institutions are focusing on entrepreneurship and innovation to deal with market uncertainty. This chapter discusses the role of entrepreneurial universities in society from a policy perspective.

Chapter 8 titled 'Entrepreneurial universities as determinants of technology entrepreneurship' by Guillermo A. Zapata-Huamani, Sara Fernández-López, Lucía Rey-Ares and David Rodeiro-Pazos discusses the role of new technology-based firms. These types of firms are important in linking entrepreneurship education to economic development.

Chapter 9 titled 'Dynamics of student entrepreneurial teams: understanding individual coping strategies to build efficient teams' by Sandrine Le Pontois and Stéphane Foliard reviews the literature about collective action in entrepreneurship education. This helps to understand how student teams need to embrace a culture of entrepreneurship.

Chapter 10 titled 'The role of entrepreneurship education and its characteristics in influencing the entrepreneurial intention: a study based on India and the UK' by Kavita Panwar Seth, Fintan Clear, Tariq Khan and Sharmaine Sakthi Ananthan discusses the role of entrepreneurship

education from a cross-cultural comparative view. This chapter helps to understand whether there are differences in entrepreneurial intention based on cultural and societal conditions.

Chapter 11 titled 'Building technology entrepreneurship capabilities: an engineering education perspective' by Kari Kleine, Ferran Giones, Mauricio Camargo and Silke Tegtmeier focuses on entrepreneurship education from an engineering point of view. As there is more emphasis on the interdisciplinary nature of entrepreneurship education, this chapter provides a useful understanding about science and technology development.

Chapter 12 titled 'Entrepreneurial actions towards the success of exponential technologies' by Sandro Battisti, Eduardo Giugliani, Rafael Prikladnicki and Paolo Traverso discusses the role of information and communications technology in entrepreneurship education. This helps to bring a sense of understanding about the role of innovation ecosystems in education.

Chapter 13 titled 'Conclusion: future suggestions for entrepreneurial universities' by João J. Ferreira, Alain Fayolle, Vanessa Ratten and Mário Raposo concludes the book by providing a summary of the chapters and suggestions for future research.

CONCLUSION

There is still much work required for universities to be seen as entrepreneurial. Some universities do this better than others and can be used as case studies to encourage more entrepreneurship. There is often a time lag occurring between the establishment of entrepreneurship and the actual ecosystem developing at universities. Entrepreneurial ecosystems are important at universities as a way to embrace change, but also to plan for the future. The aim of this book is to focus on entrepreneurial universities in terms of how they are managed and integrated into global society.

In this chapter, the role of entrepreneurial universities in society was examined. This helps to understand the strategic direction universities are taking in the global economy. Much of the change is the result of technological advancements and changes in social trends that affect the lives of individuals. In order to foster more interest in entrepreneurial universities there needs to be increased awareness of their importance. Entrepreneurial universities are higher education institutions that have a clear purpose to embed innovative thinking on their campuses, which the next chapters in the book will discuss in more detail.

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