ASSESSMENT OF REGIONAL ENTREPRENEURSHIP ECOSYSTEMS IN AUSTRALIA: A MIXED METHODS APPROACH

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ABSTRACT

Entrepreneurs do not operate independent of their surroundings: They are influenced by, and in turn, affect the community in which they operate. The study of entrepreneurship ecosystems is critical from the standpoint of supporting venture creation and entrepreneurial activity. However, most current methods of ecosystem assessment only provide limited insight because they look at multiple ecosystems concurrently. Further, despite general consensus that robust entrepreneurship ecosystems require a diverse set of attributes, assessments frequently measure a single variable at a time. We introduce a mixed methods approach to better understand perceptions within an individual entrepreneurship ecosystem. Using Q methodology, we have participants rank statements about their entrepreneurship ecosystem based on agreement. Data is then supplemented with a survey and qualitative analysis of sentiment towards the ecosystem. Results were analyzed to identify profiles prevalent in each ecosystem. This approach is unique in that it evaluates multiple attributes concurrently, giving a multifaceted perspective of each ecosystem. We applied this method to four distinct ecosystems in Queensland, Australia. Results from this study allowed us to identify profiles within each ecosystem, giving a multifaceted perspective of each location. It also allowed us to directly view similarities and differences among these ecosystems.

INTRODUCTION

Importance of this Study

This study developed a method to better understand perceptions towards a single entrepreneurship ecosystem ("ecosystem"). Feld (2012) notes that ecosystems are comprised of a diverse set of stakeholders – including current and aspiring entrepreneurs, mentors, investors, and pertinent government officials. We aimed to engage a multifaceted set of stakeholders to provide comprehensive viewpoints for the ecosystem they are a part of. Further, this allows us to discover diverse mindsets present within an individual ecosystem. Understanding these views will help provide a more in-depth understanding of ecosystem needs, which can influence ecosystem development policies and resources.

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There is a general consensus amongst researchers that a diverse set of attributes (e.g. resources for new businesses, cultural perceptions of entrepreneurship) is needed for a robust entrepreneurship ecosystem. It is advantageous to use Q methodology for studying these perceptions of available attributes within a local entrepreneurship ecosystem. Q methodology identifies factors, or patterns of statements, which correspond to profiles prevalent within an ecosystem. This can give a more comprehensive, multivariable view of entrepreneurship ecosystems than methods used in past literature, which tend to measure and look for correlations among single variables at a time.

To validate this research with real-world data, we applied this methodology to evaluate four distinct ecosystems throughout Queensland, Australia. While past research has looked at the state of entrepreneurship in Australia, it is often at a statewide or national level and is usually comprised of multiple diverse, distinct ecosystems (Steffens and Hechavarria, 2014). However, perceptions of entrepreneurship within an ecosystem are not generalizable, and these previous approaches overlook the unique characteristics present in individual ecosystems.

Further, by using the same methodology for multiple ecosystems, we are able to make a direct comparison, identifying similarities and differences between each community. While past research has looked at individual ecosystems, it tends to look at large urban areas (Yigitcanlar and Velibeyoglu, 2008), overlooking smaller cities and regional centers. When analysis does look beyond major urban areas, it is typically for a single ecosystem (Haines, 2016), making it difficult to compare to other locations. The method shared in this paper can be implemented without a prohibitively large number of participants, while still providing a comprehensive view into each individual ecosystem. Through the implementation of this method in four different ecosystems, we show that it can also analyses a diverse range of ecosystems regardless of size, established resources, or density.

The Importance of Entrepreneurship Ecosystems

Entrepreneurs cannot "go it alone"- their journey to create profitable, sustainable business involves many interactions with entities outside of their venture. These interactions will take diverse forms, including business partnerships, advising from mentors, interactions with regulatory entities, and more. Even with telecommunications advances and increasingly globalized economies, a majority of these interactions still involve entities physically near the business' location. Subsequently, the ecosystem in which a venture is created can have a significant effect on promoting entrepreneurial activity, as well as new venture survival and growth.

The potential for entrepreneurship to be a source of economic development has instigated significant interest in better understanding the surroundings in which entrepreneurs operate. It has also led to calls for creating clusters or ecosystems conducive to entrepreneurship (Isenberg 2011). Past research has looked at the network between entrepreneurs and their surroundings, as well as how these interactions occur (Slotte-Kock and Coviello, 2010; Hoang and Antoncic, 2003). Other work has looked into identifying all aspects that contribute to a robust entrepreneurship ecosystem. Feld (2012) explores all stakeholders within these ecosystems, including entrepreneurs, investors,mentors, large business partners, and university personnel. This research has found that surrounding ecosystems can have a significant effect on entrepreneurial

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activity. Others have developed instruments for assessing ecosystem strength, and identifying areas for improvement (Stangler and Bell-Masterson, 2015; Markley et al., 2005).

However, ecosystem-level action is not the only approach for promoting entrepreneurship, and many have also recognized the importance of developing current and aspiring entrepreneurs (Markley et al., 2015). Lichtenstein and Lyon, (2001, 2010) cite the "quantity and quality" of entrepreneurs as vital to robust entrepreneurial activity. There is extensive literature aimed at developing human capital and teaching skills often used in new business creation. In addition, there is an entire emerging field of entrepreneurship education, which aims to implementeffective measures for training entrepreneurs and measuring its impacts (Pittaway and Cope, 2007; Samwel Mwasalwiba, 2010).

While developing human capital for entrepreneurs remains important, it does not diminish the significance of entrepreneurship ecosystem composition. Instead, this bifurcation of approaches is complementary rather than contradictory. While entrepreneurs create economic value, they often do so utilizing business assets in their community (Pittaway and Cope 2007; Samwel Mwasalwiba, 2010). Further, entrepreneurs are frequently seen as leaders within an ecosystem (if informal ones), and their development contributes to an ecosystem's overall robustness (Feld, 2012; Motoyama et al., 2014). One result of this complementary nature is the development of a hybrid model for promoting entrepreneurship (i.e., entrepreneurs and their ecosystem concurrently (Markley et al., 2015).

Attributes of Healthy Entrepreneurship Ecosystems

Past research has investigated factors important to healthy entrepreneurship ecosystems. While there is no consensus on the exact variables necessary for a robust ecosystem, research generally agrees that a diverse set of resources is necessary for a healthy ecosystem. Some of the traits frequently cited for ecosystems are elaborated in the coming paragraphs. This literature wasreferenced when designing our study.

Many have cited a "critical mass," or a high density of resources as important to an entrepreneurship ecosystem. This density applies to many elements -- including startups; entrepreneurship resources like accelerators and financing; large businesses and business infrastructure; and human capital (Stangler and Bell-Masterson, 2015). Having a large number of new businesses and entrepreneurship resources allows for more connections and sharing of ideas. It can also help influence local culture to be more encouraging of entrepreneurial actions (Feld, 2012). Subsequently, many aspiring entrepreneurs will be drawn to locations with high resource density.

Access to capital and startup-friendly financing is one of the most frequently cited resources needed by an entrepreneurship ecosystem. It can take time for a new business to become profitable, and financial investment is often needed to attempt to reach this stage. Funding for new businesses can come from many different sources. Venture Capital Firms and Angel Investors will invest funds in exchange for equity in the company. Sometimes successful entrepreneurs will invest earnings from previous businesses as equity investors. Though less popular, traditional banking loans and government grants are also used by some startups to fund early-stage development (Feld, 2012). Crowd funding and customer-based financing are becoming an

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Increasingly used funding mechanism for startups. This approach relies on small contributions from many individuals, often in return for a future product (Mollick, 2014). With new businesses having highly variable financing requirements, it is not surprising that a robust entrepreneurship ecosystem will require diverse financing resources.

Universities are frequently cited as important contributors to entrepreneurship ecosystems in diverse ways. They provide human capital development for both entrepreneurs and startup employees. Further, university researchers create new technologies, some of which have commercial potential (Feld, 2012). In addition, many faculty at universities are experts in their field and can serve as advisors or mentors to new businesses. As a result, research has noted many productive ecosystems are located near universities, like Oxford in the United Kingdom or Boulder, Colorado in the United States (Mason and Brown, 2014).

Government can also play a significant if indirect role in promoting entrepreneurship. It creates policies and regulations that can encourage new firm creation. Further, it can sometimes provide other resources, like funding (often in the form of grants) or co working spaces, to help new businesses. Finally, government often partners with universities and other research institutions, funding the development of technologies with commercial potential (Feld, 2012). However, there is not a unanimous consensus on the role the government should play within an entrepreneurship ecosystem. Some have noted that the hierarchical structure of governments is not conducive to entrepreneurship. Isenberg (2010) states "Government cannot build ecosystems alone. Only the private sector has the motivation and perspective to develop self-sustaining, profit-driven markets." As a result, while government can contribute to healthy ecosystems, it often does not take a primary or leadership role in promoting entrepreneurship ecosystems.

It is important for entrepreneurship resources to not only exist within an entrepreneurship ecosystem, but also to be accessible by entrepreneurs that would utilize them to further business development. While an ecosystem does not have to be highly structured, these entrepreneurs must be able to identify and access the most beneficial resources within the ecosystem in which they exist. Auserwald (2014) advocates for mapping an ecosystem and its resources, so that entrepreneurs can use these maps to identify beneficial tools and strategies. Mason and Brown, (2014) defines the term "deal-makers" as "business people with the skills, know-how and connections to people and resources to support young companies." These individuals are critical for connectivity and link startups to needed resources through introductions and other methods. One result of the identified need for connectivity is a focus on local areas. Some have even argued that local events focused exclusively on facilitating local connections can promote entrepreneurship and contribute to entrepreneurship ecosystems' breadth (Motoyama et al., 2014). Finally, culture and attitudes towards entrepreneurship can influence entrepreneurial activity. Entrepreneurial actions happen more readily in communities that embrace entrepreneurs and don't stigmatize taking business risks (and negative outcomes like business failure or bankruptcy). Further, communities that celebrate entrepreneurs and don't discourage publicly displaying success also have higher rates of entrepreneurial activity (Lee and Peterson, 2000; Isenberg, 2010).

The Global Entrepreneurship Monito conducts annual surveys of entrepreneurship for multiple countries around the world. The instrument this organization uses includes questions

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about fear of business failure as a deterrent towards entrepreneurship; the belief that entrepreneurship is respected in the respondent's country; and whether the media frequently publishes stories about successful entrepreneurs (Steffens and Hechavarria, 2014).

Past Evaluation of Entrepreneurship Ecosystems in Australia and Queensland

The significant levels of national and state attention to new venture creation in Australia are in part the result of a deliberate effort to foster regional entrepreneurial initiatives. These initiatives have been spearheaded by both public and private interest in startup incubators and accelerators. The Global Entrepreneurship Monitor regularly collects detailed information on entrepreneurial activity and attitudes in Australia. Their survey found high rates of entrepreneurial activity and informal investment in startups. Further, the country has high rates of perceived opportunities and capabilities needed for business creation. However, fear of failure as a deterrent to business creation was higher than average when compared to other developed nations (Steffens and Hechavarria, 2014). One limitation of Steffens and Hechavarria's (2014) study is that it looks at the entire country as a whole, grouping multiple distinct ecosystems into a single dataset. While this generalized perspective can provide an informative overview, it does not give an accurate account of attitudes within a single ecosystem. As a result, this report cannot be considered an accurate account of entrepreneurship attitudes within individual Queensland ecosystems.

Entrepreneurial ecosystems in Queensland provide an interesting case study. The Advance Queensland initiative, launched in 2015, focuses on innovation and entrepreneurship within the region, including establishing the office of chief entrepreneur. One focus of this agency is tracking and publishing entrepreneurial activity in the state. It has published quantitative metrics, like new business starts, jobs created, and investment in new businesses (Markham et al., 2015). Further, it has examined attitudes towards innovation in regions throughout the state (Department of Science, Information, and Technology & Innovation, 2017). Once again, these publications primarily convey findings from multiple ecosystems concurrently, making it difficult to understand individual ecosystems.

METHODOLOGY

To gain a holistic viewpoint of entrepreneurs' perceptions of their current ecosystem, a mixed methods approach was required. A convergent parallel mixed methods design including Q methodology was used, in which qualitative data and quantitative data were analyzed separately and then merged. For this study, qualitative data, in the form of the Q sort and open-ended survey questions, was collected while a quantitative post-survey was conducted. The post-survey included Likert-type scales that were tested quantitatively and open-ended questions that were analyzed qualitatively. The quantitative post-survey was included to further explain entrepreneur's perceptions, while the open-ended questions on the post-survey provided additional insight into the participants' Q sort selections. Findings from the qualitative data and results from the quantitative data were compared and synthesized. Interpretation of the merged findings and results are available in the joint analysis in Appendix A. Thus, mixed methods were used to triangulate, elaborate, and expand upon our understanding of the multisite case.

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Our participant group was comprised of a diverse group of stakeholders in each entrepreneurship ecosystem that we analyzed. While there were no quotas for specific roles within an ecosystem, we made sure to collect input from individuals with many different roles, including current and aspiring entrepreneurs, mentors, educators, pertinent government officials, and investors. This ensured that we collected diverse viewpoints that accurately represented each ecosystem.

Design and Collection of Data

Table 1
Q SET (STATEMENTS) USED FOR Q SORT

S. No	Statement
1	In the next 6 months, there will be good opportunities to start businesses in the community where I live.
2	Telecommunications infrastructure (i.e. telephones, internet, and mobile phone service) is sufficient for most Businesses in my community.
3	Transportation infrastructure (i.e. roads, trains) is sufficient for new business creation in my community.
4	In my community, it is easy to move between jobs when needed.
5	The government creates laws that help promote successful businesses in my community.
6	Large businesses in my community support entrepreneurship.
7	Business creation is easier in large cities than smaller ones.
8	Workers are sufficiently trained in the skills needed by new businesses in my community.
9	The economy of my community is diverse, as there are businesses and employment in many different industries.
10	There are opportunities for entrepreneurship in many different industries within my community.
11	In my community, the number of female entrepreneurs is approximately equal to the number of male entrepreneurs.
12	Many entrepreneurs start their business because there are no better sources of work or income.
13	In my community, the rate of new businesses being created is greater than the rate of established businesses being discontinued.
14	Many businesses in my community have a majority of sales come from international customers.
15	Successful entrepreneurs have a high level of status and respect in my community.
16	Much new and small business in my community will create jobs in the next 5 years.
17	Many new businesses are innovative, and sell products or services not offered by competitor companies.
18	My community has adequate funding opportunities for startups looking to expand.
19	Regulation is not overly burdensome (i.e. regulations do not prevent new business creation in my community).
20	Various entrepreneurship resources are well-integrated within my community, and many new businesses are able to identify and utilize these resources.
21	Business regulations in my community favor incumbent companies over new ones.
22	There are many successful business owners in my community willing to mentor aspiring entrepreneurs.
23	There are many new businesses in my community.
24	There are many resources (incubators, education, and mentorship) to support entrepreneurs within my community.
25	There are individuals within my community that help direct new businesses towards pertinent entrepreneurship resources.
26	Fear of failure prevents many individuals in my community from starting a business.
27	My community has a high rate of population flux (people moving in and out).

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28	I will often see stories in the public media about successful new businesses.
29	Many people in my community intend to start a new business in the next 3 years.

With the use of Q methodology, it is possible to measure subjective behaviors in an objective manner (Ramlo and Newman, 2011). Q methodology uses a modified factor analysis (Davis, 1999) to determine representative factors that show patterns found among participant perceptions (Raje, 2007; Watts and Stenner, 2012). Such patterns would not be able to be determined using either qualitative or quantitative methods. Overall, Q methodology seeks to determine varied patterns and information among participants (Stephenson, 1935; Stainton Rogers, 1995).

Development of Q set

We created a Q set of 29 statements related to entrepreneurship (reproduced in Table 1). The Q set was made before dissemination to participants and were developed based on insights gained through literature, surveys, and interviews. (Strangler and Bell-Masterson 2015; Feld 2012; Motoyama et al., 2014). A pilot test was conducted with comparable stakeholders in both the UnitedStates and Australia to determine participant understanding of Q set statements and the study's overall procedure.

Statements in the Q set were printed on identically sized cards. We did not define the terms within the statements, as participants were expected to interpret each statement based on his or her own experiences (McKeown and Thomas, 1988; Ramlo and Newman, 2011; Stephenson, 1953).

Collection of Data

In this study, participants' perceptions were recorded via a Q sort, in which each participant the group of Q set statements. Statements were ranked based on how strongly the participant agreed or disagreed with each one. The Q sort used for this study consisted of a grid with 29 blank spaces (Figure 1 & 2), Participants were guided to rank the 29 Q set statements, by placing a single statement card in each empty grid space. Since each participant used an identicalQ set, diverse viewpoints were able to emerge. Once this grid was completed, we had participants fill out a post-sort survey. This survey asked for qualitative feedback about the four most extreme statements. Next, we asked participantsto indicate their agreement with statements about their own entrepreneurial capabilities. These questions used a 5-point Likert-type scale, ranging from "Strongly Agree" to "Strongly Disagree." Q sorts and surveys were completed anonymously, but all research instruments were linked usinga serial number for future analysis.

Ecosystems Evaluated

For this study, we evaluated four distinct ecosystems in Queensland, Australia, using the same set of instruments, which included the Q sort and post-survey. This approach was intentional, as it allowed us to directly compare perceptions within multiple ecosystems throughout Queensland. Two of these ecosystems were located in Southeast Queensland: Logan/Redlands (located in a suburban area within Brisbane Metropolitan Area) and Gold Coast (a small city

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~70km Southeast of Brisbane). We also looked at ecosystems for the regional cities of Rockhampton, and Townsville. These ecosystems are highly variable in terms of size, location, and levels of entrepreneurship activity, and provide diverse environments for testing this method. Further, by focusing on ecosystems outside of the City of Brisbane, we were able to examine ecosystems that have been largely un analysed in previous research, addressing a current gap in literature.

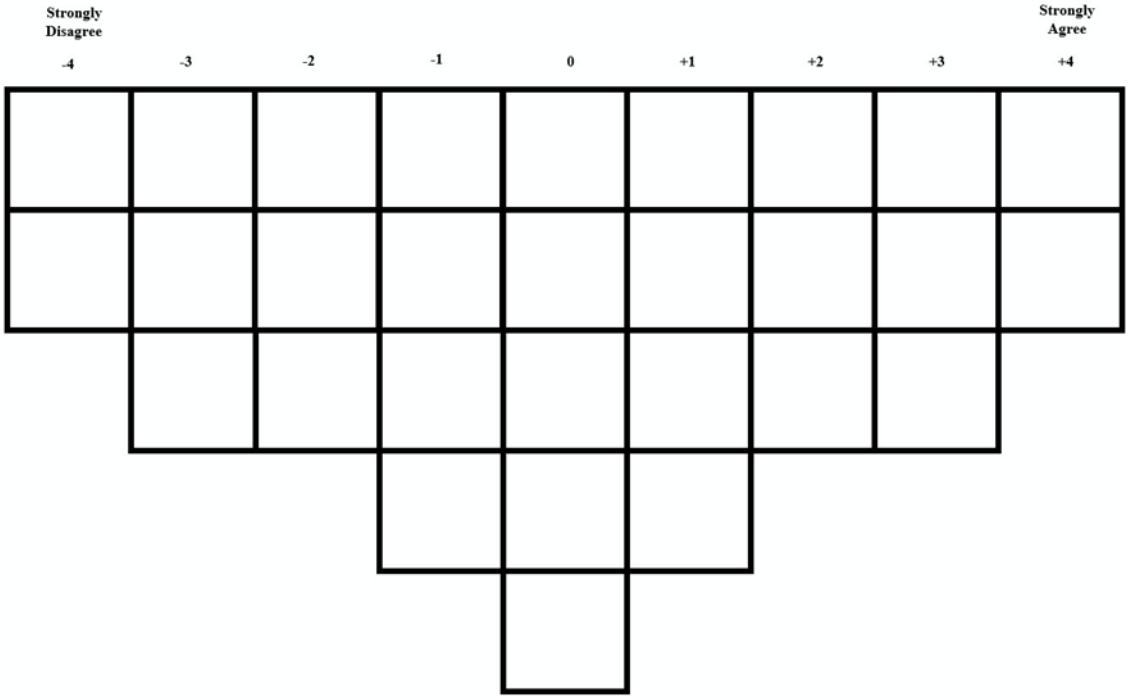

FIGURE 1
Q SORT GRID USED FOR THIS STUDY STATEMENTS WERE SORTED HORIZONTALLY FROM"STRONGLY DISAGREE" (LEFT) TO "STRONGLY AGREE" (RIGHT). STATEMENTS IN THE SAME COLUMN HAVE THE SAME LEVEL OF AGREEMENT.

DISCUSSION OF FINDINGS

The factor analysis described above identified individual Q sort responses with similar viewpoints within each ecosystem. For each factor identified, a factor exemplifying Q sort (factors)shows the ranking of each statement (ranging from "Strongly Disagree" at -4 to "Strongly Agree"at +4) within that factor. The factor exemplifying Q sorts for all ecosystems measured are reproduced in Table 2 and grouped by ecosystem. Each column represents a single factor, with thenumber representing the statement's position on a single Q sort grid for that factor. Viewing the table by row will show how a statement ranked across all factors. Based upon the ranking of statements within the factor exemplifying Q sorts, we further analyzed each factor's characteristicsfor notable similarities and differences.

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FIGURE 2
LOCATION OF ECOSYSTEMS WITHIN QUEENSLAND EXAMINED IN THIS STUDY MAP CREATED USING ARCGIS

Q Methodology

A brief discussion of significant factors in each ecosystem is elaborated in the following paragraphs. For Q methodology, the most extreme statements (+4 and -4) are most significant, since they indicate the statements that participants felt most strongly about. We also looked for similarities and disparities between factors within an ecosystem, as these can be indicators of common themes or polarization, respectively.

Qualitative Methods: Case Study

The foundations of a collective, multisite case study guided the qualitative phase of this study. Case studies must be bound by specific parameters, in which our study is bound by the ecosystem, current economic challenges, and the population of stakeholders. For the qualitative phase, multiple sources of information were gained from literature reviews and pre-research stakeholder discussions, which guided the creation of open-ended survey questions. Thus, qualitative data was gathered through the post-survey's open-ended questions and were analyzed for themes. This study analyzed multiple ecosystems (or sites), including Logan/Redlands, Gold Coast, Rock Hampton, and Townsville.

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Table 2
FACTORS EXEMPLIFYING Q SORTS FOR ALL ECOSYSTEMS

#	Statement	Logan		Gold Coast			Rockhampton				Townsville	
		L-1	L-2	G-1	G-2	G-3	R-1	R-2	R-3	R-4	T-1	T-2
1	In the next 6 months, there will be good opportunities to start business in the community where I live	1	4	1	1	3	0	3	-1	3	1	2
2	Telecommunications infrastructure (i.e. telephones, internet, mobile phone service) is sufficient for most business in my community	0	3	1	3	-2	1	-4	0	-3	4	1
3	Transportation infrastructure (i.e. roads, trains) is sufficient for new business creation in my community	-3	3	2	1	-2	2	-3	2	-2	0	-1
4	In my community, it is easy to move between jobs when needed	-4	0	-1	-1	-3	-3	0	-3	3	-3	-4
5	The government creates laws that help promote successful business in my community	2	2	-2	3	-1	0	-2	0	-1	0	-3
6	Large business in my community support entrepreneurship	1	-1	-3	-3	-2	-2	-3	0	1	0	-1
7	Business creation is easier in large cities than smaller ones.	3	0	-1	2	1	4	2	-1	-4	4	-4
8	Workers are sufficiently trained in the skills needed by the new businesses in my community	-1	-2	0	-2	-4	-3	0	-3	0	-2	-3
9	The economy of my community is diverse, as there are businesses and employment in different industries	1	4	0	0	1	1	1	-3	3	-2	3
10	There are opportunities for entrepreneurship in many different industries within my community	-2	2	4	0	2	0	4	-2	4	-1	2
11	In my community the number of females entrepreneurs is approximately equal to the number of male entrepreneurs	-4	-4	0	0	-3	-2	-3	4	1	-1	1
12	Many entrepreneurs start their business because there are no better sources of work or income	4	-3	-1	-4	-1	3	4	4	1	3	-2
13	In my community, the rate of new businesses being created is greater than the rate of established businesses being continued	-1	-2	0	-3	0	-4	0	-2	0	-3	-2
14	Many businesses in my community have a majority of sales come from international customers	-3	-3	2	-4	-1	-1	-1	-4	-1	-1	-1
15	Successful entrepreneurs have a high level of status and respect in my community	2	3	2	-2	4	3	2	2	2	1	0
16	Many new small businesses in my community will create jobs in next 5 years	3	1	1	-2	4	-1	2	3	-3	2	1
17	Many new businesses are innovative, and sell products or services not offered by competitor companies	4	0	-3	2	1	0	0	-2	-1	0	-3
18	My company have adequate funding opportunities for start-ups looking to expand	-1	1	-4	1	-4	1	1	-4	-1	-4	-2
19	Regulation is not overly burdensome (i.e., regulations do not prevent new business creation in my community)	2	-3	-3	4	1	0	-1	-1	-4	1	2

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20	Various entrepreneurship resources are well-integrated within my community, and many new businesses are able to identify and utilize these resources	-2	-4	-1	2	0	-4	0	1	-2	-3	0
21	Business regulations in my community favour incumbent companies over new ones	0	-1	1	0	0	3	1	0	1	2	0
22	There are many successful business owners in my community willing to mentor aspiring entrepreneurs.	-2	-2	-2	-1	3	2	-2	1	4	-1	3
23	There are many new businesses in my community	-3	1	3	-1	0	1	3	0	-2	-2	-1
24	There are many resources (incubators, education, mentorship) to support entrepreneurs within my community	-1	2	-2	0	2	-1	3	1	0	-4	3
25	There are individuals within my community that help direct new businesses towards pertinent entrepreneurship resources.	0	-1	-4	1	2	2	-1	3	2	2	4
26	Fear of failure prevents many individuals in my community from starting a business	3	1	4	4	-1	4	-4	-1	0	3	4
27	My community has a high rate of population flux (people moving in and out)	1	0	3	3	0	-1	-2	1	2	3	0
28	I will often see stories in the public media about successful new businesses	0	0	3	-1	3	-2	-1	3	0	0	1
29	Many people in my community intend to start a new business in the next 3 years	0	-1	0	-3	-3	-3	1	2	-3	1	0

DISCUSSION OF INDIVIDUAL ECOSYSTEMS

Logan/Redlands Q Methodology and Qualitative Findings

Two factors emerged from the Q analysis, in which a total of 43% of the study's variance was explained. Six participant Q sorts were analyzed for Factor 1, while five participant Q sorts were analyzed for Factor 2. All analyzed Q sorts loaded significantly on its respective factor.

Logan/redlands factor 1:

Factor 1 represents the "Forced Innovators." These participants are pushed to create their own opportunities due to a lack of job opportunities or income (12: +4), as it is not easy to move between jobs within the Logan community (4: -4). Overall, new businesses do not sell products or services offered by competitors (17: +4), which could lead to greater revenue. Females are also not viewed as having an equal presence when starting new businesses (11: -4).

Logan/redlands factor 2:

Factor 2 represents the "Industry Diverse Ambassadors." Participants view their local economy as diverse, as many different industries are represented (9:+4). Due to this diversity, there are many opportunities to start a business in various industries (1:+4), but gender equality has not been reached in Logan (11: -4). Resources are also not well- integrated into the community (20: -4).

One qualitative theme found in this ecosystem provides additional insight into Factor 2. This theme is entitled "As there are a diverse set of businesses and industries, a wide set of

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opportunities exist." One participant stated that there are 21 unique cultures represented in the local community, which help to demonstrate ethnic diversity. Technical and demographic backgrounds are also diverse and add to the opportunities available to job seekers. An aging population is also noted as changing how business is conducted and may present future opportunities in this community.

Similar patterns among logan/redlands ecosystem factors 1 and 2:

Resourcesessential for entrepreneurs are not integrated into the community, and businesses are not able to readily access the resources needed (Factor 1-(20: -2); Factor 2-(20: -4)). In addition, the number of female entrepreneurs still hasn't reached the number of male entrepreneurs (Factor 1-(11: -4); Factor 2-(11: -4)).

A key qualitative theme found in Logan/Redlands spans across both factors and delves into the obstacles that many entrepreneurs face when starting a business. This theme is entitled "It is always an obstacle to pursue a career." Although there are diverse opportunities and demographics to sell to, it is perceived that there is a lack of local customers. Overall, it is believed that financial and mentor support would be needed. This finding is in agreement with results from the Logan/Redlands Q methodology -- both factors assigned neutral or negative rankings for statements regarding funding and mentorship (Statements 18, 22, and 25). In order to run a successful business, extensive training would also be necessary.

Gold Coast Q Methodology and Qualitative Findings

Three factors emerged from the Q analysis, in which a total of 52% of the study's variance was explained. Six participant Q sorts were analyzed for Factor 1, thee for Factor 2, and four for Factor 3. All analyzed Q sorts loaded significantly on their respective factor.

Gold coast factor 1:

Factor 1 represents the "Innovative Pessimists." Participants representing this factor identified a strong fear of failure, which prevents many individuals from starting a business (26: +4). While there are diverse areas of enterprise growth (10:+4), individualsin the community do not help direct new entrepreneurs to helpful resources (25: -4). In addition, the community doesn't have funding opportunities for startups (18: -4).

Gold coast factor 2:

Factor 2 represents the "Prosperous Explorer." Despite the lack of burdensome regulations (19: +4), the fear of failure when starting a business is still high (26: +4).Even when perceiving a high fear of failure, entrepreneurs are not viewed as needing work or income (12:-4). Current businesses have also not expanded internationally and do not seek international customers (14: -4).

Gold coast factor 3:

Factor 3 represents the "Respected Community Builders." Participants contributing to this profile believe that entrepreneurs have a high level of respect in the community (15: +4) and that

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many new businesses are expected to create jobs within the community in the next five years (16: +4). Despite the availability of mentorship and resources, workers are not sufficiently trained in skills desired by new businesses (8: -4). This could be due to the lack of funding that startups need (18: -4).

One qualitative theme found in Gold Coast aligns with Factor 3. It is entitled "Successful business owners are willing to mentor, provided they are not in direct competition." It noted that current business owners are willing to share their expertise with aspiring entrepreneurs, providing insight into the industry. Further, government programs have also fostered these relationships through developing grant packages and other incentives. Stakeholders are also encouraged to invest in startups, which helps provide monetary resources to new businesses. The ranking of Statement 22 ("There are many successful business owners in my community willing to mentor aspiring entrepreneurs") across all three factors highlights how this qualitative theme most aligns with Factor 3 (Factor 1-(22:-2); Factor 2-(22:-1); Factor 3-(22:3)).

Similar patterns among gold coast ecosystem factors 1, 2, and 3:

Entrepreneurs havea high level of status in the community (Factor 1-(15: +2); Factor 3-(15: +4)), and there are manyopportunities for entrepreneurial growth in a variety of industries (Factor 1-(10: +4); Factor 3-(10: +2). An overall lack of funding opportunities, however, may thwart any entrepreneurial growth (Factor 1-(18: -4); Factor 3-(18: -3)).

Diverse patterns among gold coast ecosystem factors 1, 2, and 3:

Factor 1 believes that regulations are burdensome (19: -3) and that international sales constitute a majority of the profit (14: +2), while Factor 2 believes that regulations are not overly burdensome (19: +4) and that local businesses are not tapping into the international market (14: -4). Factor 3 stated that entrepreneurs have a high level of status in the community (15: +4), which may facilitate new business and job creation in the next five years (16: +4). In contrast, Factor 2 believes that entrepreneurs are not viewed highly in the community (15: -2) and that jobs will not be created bynew businesses in the near future (16: -2). When starting a business, Factor 1 perceives that community members do not help entrepreneurs find resources (25: -4), while Factor 3 specifies that community members are available to provide help (25: +2).

The second qualitative theme found in this ecosystem is entitled "It's not culturally acceptable to be highly successful in business." Many responses noted Tall Poppy Syndrome is of concern to aspiring entrepreneurs and believed there is a stigma attached to successful business owners. Business owners are, however, highlighted routinely in the media. Entrepreneurs are also believed to provide job creation and exert political influence in the community. Overall, the local community tends to be conservative and practical.

Rockhampton Q Methodology and Qualitative Findings

Four factors emerged from the Q analysis, in which a total of 57% of the study's variance was explained. Four participant Q sorts were analyzed for Factor 1, three participant Q sorts were analyzed for Factor 2, three participant Q sorts were analyzed for Factor 3, and three

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participant Qsorts were analyzed for Factor 4. All analyzed Q sorts loaded significantly on their respective factor.

Rockhampton factor 1:

Factor 1 represents the "Resource Seekers." Fear of failure is very high (26: +4), which could be due to resources not being well-integrated into the community (20: -4). Factor 1 participants also believe that business creation is easier in large cities (7: +4) as the rate of new business is not greater than the rate of established businesses closing (13: -4).

Rockhampton factor 2:

Factor 2 represents the "Confident Initiators." Overall, the fear of failure is low (26: -4) for these participants. While entrepreneurs are starting their own businesses due to of a lack of work opportunities (12: +4), there are still many opportunities for new businesses within a variety of industries (10: +4). The development of new businesses is limited, however, due to the insufficient telecommunications infrastructures (2: -4).

Rockhampton factor 3:

Factor 3 represents the "Financial Equalizers." Adequate funding is not available for startups (18: -4), and individuals need to start new businesses in the community, as there aren't any better sources of income (12: +4). Opportunities for businesses to grow are limited due to a minority of sales coming from international customers (14: -4). Overall, the number of female entrepreneurs is perceived to be equal to the number of male entrepreneurs in the community (11: +4).

Rockhampton factor 4:

Factor 4 represents the "Local Opportunists." Business creation is not easier in large cities than smaller cities (7: -4), as there are many opportunities for new businesses in a variety of industries (10: +4) in Rockhampton. Many business owners are willing to mentor new entrepreneurs (22: +4), but it may not help as much due to overly burdensome regulations for new businesses (19: -4).

A qualitative theme emerged that provided additional insight into Rockhampton's Factor. The theme is entitled "It has been easy to diverge into other industries, however it helps if you know people." It is perceived that there are a limited number of industries in Rockhampton, but include agriculture, beef, mining, healthcare, and tourism. All other businesses tend to focus on working with regional centers. In the local community, there are many small businesses and there are few options for products and services. Participants also discussed the need for technological jobs in the community instead of many lower-paying career options.

Similar patterns among rockhampton ecosystem factors 1, 2, 3, and 4:

It is perceived that new business creation is easier in larger cities (Factor 1-(7: +4); Factor 2-(7: +2)), and many entrepreneurs start their businesses because income and work opportunities

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are limited (Factor 1-(12: +3); Factor 2-(12: +4); Factor 3-(12: +4)). Resources are also not well-integrated into the community (Factor 1-(20: -4); Factor 4-(20: -2)), but there are many opportunities for entrepreneurship within different industries (Factor 2-(10: +4); Factor 4-(10: +4)) even though the telecommunications infrastructure is not sufficient (Factor 2-(2: -4); Factor 4-(2: -3)). Entrepreneurs have a high level of respect in Rockhampton (Factor 1-(15: +3); Factor 3-(15: +2)),and many business owners are willing to mentor new entrepreneurs (Factor 1-(22: +2); Factor 4- (22: +4)).

One qualitative theme from Rockhampton, entitled "We have zero integrated planning across agencies" elaborates on the infrastructure in Rockhampton, particularly noted in Factors 2 and 4. Even though the telecommunications infrastructure is sufficient in town, rural areas still have limited access. There are many internet infrastructure issues as well, which also includes high costs. Locally, the business community can access rail, road, and air options. While the transportation infrastructure appears to be sufficient, the various choices among transport systems do not work together.

Diverse patterns among rockhampton ecosystem factors 1, 2, 3, and 4:

High fear of failure prevents many people from starting a business (26: +4), even though successful business owners are willing to mentor new entrepreneurs (Factor 1-(22: +2); Factor 4-(22: +4)). Factor 2 disagrees with these statements; however, as there is a low fear of failure (26: -4) even when business owners are not willing to mentor (22: -2). Factor 3 also perceives that the number of female entrepreneurs is approximately equal to the number of male entrepreneurs (11: +4), while Factors 1 and 2 challenge that belief (Factor 1-(11: -2); Factor 2-(11: -3)). Factors 1 and 2 also perceive that business creation is easier in larger cities (Factor 1-(7: +4); Factor 2-(7: +2)), while Factor 4 believes that business creation is not easier in larger cities (7: -4). Factors 2 and 4 perceive the availability of opportunities across many different industries (Factor 2-(10: +4); Factor 4-(10:
+4)), while Factor 3 does not perceive such opportunities (10: -2).

Townsville Q Methodology and Qualitative Findings

Two factors emerged from the Q analysis, in which a total of 48% of the study's variance was explained. Seven participant Q sorts were analyzed for Factor 1, while three participant Q sorts were analyzed for Factor 2. All analyzed Q sorts loaded significantly on their respective factor.

Townsville factor 1:

Factor 1 represents the "Resource Pacesetters." Due to limited funding opportunities (18: -4) and limited resources (24: -4), business creation is considered to beeasier in large cities than smaller ones (7: +4). Despite these downfalls, the telecommunications infrastructure (2: +4) in Townsville is considered sufficient for new business development.

Townsville factor 2:

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Factor 2 represents the "Grateful Creators." While the fear of failure is high among entrepreneurs (26: +4), there are many individuals that help direct new businesses to pertinent resources (25: +4). Overall, business creation is perceived to be easier in smaller cities like Townsville (7: -4), though it is not easy to move between jobs there (4: -4).

One qualitative theme that emerged for Townsville sheds additional insight on Factor 2. This theme is entitled "It will be smaller businesses that step in to fill the gap". Many businesses are moving to larger cities, which leaves a growing opportunity for new businesses to be formed. It is perceived that existing businesses are moving to larger cities due to a failing local economy. There are currently empty storefronts, which have been vacant for an extended period of time. This has led to a high unemployment rate and limited work opportunities. The location of a business is vital, as rural locations make selling products and developing an international presence more difficult.

Similar patterns among townsville ecosystem factors 1 and 2:

Fear of failure is high among aspiring entrepreneurs (Factor 1-(26: +3); Factor 2-(26: +4)), but there are many individuals in the community that will help find resources (Factor 1-(25: +2); Factor 2-(25: +4)). The community also does not have funding for startups to expand (Factor 1-(18: -4); Factor 2-(18: -2))and it is not easy to move between jobs (Factor 1-(4: -3); Factor 2-(4: -4)).

A second theme that emerged from the qualitative analysis, entitled "The number of entrepreneurs appears to be low," confirms the results from both Townsville factors (Factor 1-(13:-2); Factor 2-(12:-3)). A perceived lack of entrepreneurs is believed to represent a lack of support. Support comes in a variety of forms, but many participants indicated that a lack of financial support is the driving factor behind low entrepreneurial rates. Opposing sides within the government doesn't lend themselves to providing resources for entrepreneurs. Many local business owners do not provide adequate advice or knowledge of available resources. In addition, local media doesn't highlight young entrepreneurs.

Diverse patterns among townsville ecosystem factors 1 and 2:

Factor 1 perceives that business creation is easier in large cities (7: +4) and Factor 2 strongly disagrees (7: -4). Factor 1 also believes that there aren't very many resources to support entrepreneurs within the community (24: -4), while Factor 2 indicates that there are many resources (24: +3).

Direct similarities of all ecosystems:

Beyond learning the perspectives of each individual ecosystem, we can gain additional insight by comparing factors from multiple ecosystems simultaneously. This allows us to observe perceptions that are consistent throughout Queensland, as well as other mindsets unique to two or more ecosystems. Notable observations from this analysis are elaborated in the following parahraphs. One theme present in all of the ecosystems we assessed is the belief that fears of business failure deters aspiring entrepreneurs. Statement 26 ("Fear of Failure prevents

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many individuals in my community from starting a business.") had at least one factor in each ecosystem with a +3 or +4 ranking. While this mindset was predominant (6 of 11 factors ranked this statement +3 or +4), it was not universal -- some factors gave this statement a neutral ranking, and one factor in Rockhampton even ranked it -4.

This prevalence of Fear of Failure was also noted in the qualitative analysis for all ecosystems, and one theme was entitled "Many individuals do not start, therefore they do not fail." Responses noted high anxiety to start a business, and fear of failure keeps many individuals in jobs they don't want. Bankruptcy laws were also mentioned as a barrier, as individuals in Australia don't want to ruin their reputations. This observation also matches findings from past literature, which have noted a high rate of fear of failure in Australia, especially when compared to comparable developed countries (Steffens and Hechavarria, 2014).

Another mindset present within all ecosystems is that workers are not sufficiently trained for jobs at new businesses. No factor ranked Statement 8 ("Workers are sufficiently trained in theskills needed by new businesses in my community") greater than 0, and every ecosystem had at least one factor which ranked this statement -2 or lower. When elaborating on this statement, one participant stated "Workers are trained for archaic business models. The new economy is driven by data and I do not believe we are training new graduates in this area." This indicates that many feel there needs to be improved and modernized training for skills important to new startups.

Other patterns emerged for statements related to government role in encouraging business creation. For Statement 19, all ecosystems except Townsville have at least one factor with strong disagreement to this statement (ranked -3 or -4). Further, for Statement 5 ("The government creates laws that help promote successful businesses in my community.") eight out of 11 factors ranked this statement at 0 or lower. However, when looking at Statement 21 ("Business regulations in my community favor incumbent companies over new ones.") responses were mostly neutral -- 8 out of 11 factors measured ranked this statement at 0 or +1. This indicates that while there is a recurring mindset that government regulation can be overly burdensome, it affects both new and established businesses equally and does not favor one over the other.

For Statement 18 ("My community has adequate funding opportunities looking for startups to expand."), all locations except Logan/Redlands had at least 1 factor where this statement was ranked -4. It is currently unclear why this disparity was observed. One possible explanation could due to Logan's proximity to Brisbane, a hub for startup capital in Queensland. Past research has noted that many in regional Queensland believe funding is limited in Regional cities, and entrepreneurs are forced to go to large cities for financing (Markham et al., 2015). In addition, these findings can be compared to quantitative funding data for these ecosystems, which indicate that there are more robust funding resources for startups in regionalQueensland. In the years 2014-2016, new businesses in Gold Coast received more investment funding (A$69 Million) than those in Brisbane (A$45 Million). Further, Townsville had a higherrate of funding per capita than Brisbane (Markham et al., 2015). One possibleexplanation can be seen from the results for Statement 20 ("Various entrepreneurship resources are well-integrated within my community, and many new businesses are able to identify and utilize these resources"). Only two factors ranked this statement greater than 0. It is possible that fundingresources exist within these

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ecosystems, but they are not integrated or well known to entrepreneurs.

This also matches qualitative responses from some participants that mentioned they believed resources existed, but they that finding them were a challenge.

Finally, we noticed an interesting breakdown of factors for Statement 7 ("Business Creation is easier in large cities than smaller ones.") across all ecosystems. All factors for Logan/Redlands and Gold Coast ecosystems ranked this statement neutral to slightly positive, ranging from -1 to 2. However, Rockhampton and Townsville have more disparate responses, and both of these ecosystems had factors ranked +4 and -4 for this statement. It is currently unclear why this occurred, especially since this pattern was not observed for any other statement. One possible explanation is the proximity of Logan/Redlands and Gold Coast to City of Brisbane, the largest city in Queensland. Stakeholders in these ecosystems might have additional exposure to entrepreneurship in Brisbane, causing their perceptions to be less extreme.

LIMITATIONS

This study measured perceptions within a single entrepreneurship ecosystem for four distinct ecosystems. However, ecosystems are not completely isolated from one another. There is often "cross-pollination," where a single resource or stakeholder is active in multiple ecosystems. Further, entrepreneurs can be active in multiple ecosystems simultaneously. This cross-pollination is especially true of ecosystems that are geographically close to one another or are integrated in other ways. The methodology employed by this study is not meant to measure these links, and we intentionally had participants provide input for a single ecosystem. While a study of connections between multiple ecosystems might be informative, a different methodology would have to be utilized to investigate these links in more depth.

This study also provides insight into four distinct ecosystems within Queensland. However, the findings are not generalizable for other parts of Queensland and Australia. As a result, we cannot make assumptions about other ecosystems based on the results from this study. If we wanted to expand this study to other communities, it would be best to replicate this set of methods for each ecosystem to be evaluated. Once completed, we could compare these new findings to those presented in this study for insight into additional entrepreneurship ecosystems.

CONCLUSION

Using a mixed methods approach, we analyzed perceptions towards entrepreneurship in four ecosystems in Queensland, Australia. Building on past literature, we focused on traits characteristic of robust entrepreneurship ecosystems. Results from the Q sort analysis informed us of prevalent mindsets within each ecosystem, and a qualitative analysis informed us of prevalent themes which further explored the ecosystem's key perceptions. By looking at individual ecosystems, we were able to identify specific traits of that ecosystem and not an average of multiple ones combined. We were also able to directly compare findings from each distinct ecosystem. This study also reinforces the need to examine entrepreneurship ecosystems individually. Within each distinct ecosystem, we identified multiple factors that reflect the diverse perspectives within that community. This more accurately reflects the heterogeneous makeup of most entrepreneurship ecosystems than a single metric or value can convey. Further, factors in each ecosystem were highly disparate, and no two factors were alike. Past studies which examine multiple ecosystems concurrently overlook characteristics unique to an ecosystem and can only identify overall trends. While these generalized trends can be useful to

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give a quick overview of alarge area, it does not accurately capture how entrepreneurs and other stakeholders perceive the local ecosystem they are a part of. Further, ecosystem development policies based on these generalized trends alone might not be effective within a specific ecosystem. It is important to understand these perceptions, as new businesses and entrepreneurs draw a majority of support and partnerships from their local surroundings, and will be highly influenced by how relevant stakeholders perceive their ecosystem.

Finally, the method employed in this paper can be replicated to evaluate other entrepreneurship ecosystems, complementing other metrics used in ecosystem assessment. Despite a strong interest in entrepreneurship ecosystems as a means of promoting venture creation, there are many ecosystems that have never been examined in depth. This is especially true for areas outside of large urban centers and those with an extensive history of entrepreneurship. Beyond academic findings, results from this method can be utilized to guide ecosystem development efforts. They can help identify which additional resources are most needed to strengthen an ecosystem. Further, when combined with other assessment metrics, it can determine if perceptions match quantitative measures regarding ecosystem resources (e.g. a perceived lack of resources vs. an actual one). This can guide action towards bolstering new resources or increasing awareness of existing ones. As a result, this mixed method approach will be a valuable tool for anyone interested in developing their local entrepreneurship ecosystem.

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