

TECHNOLOGY BUSINESS INCUBATION IN A PHILIPPINE STATE UNIVERSITY: LESSON LEARNED FROM SOUTH AUSTRALIA BASED LEADING TECHNOLOGY BUSINESS INCUBATOR

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Transforming intellectual property into commercially-valued goods is a universal problem for universities. The Visayas State University (VSU) in Baybay City Leyte, Philippines is no exception. The capacities of VSU through its newly established Agriculture & Food Technology Business Incubator (AFTBI) and its partners are face by constrained such as but not limited to the lack of experience, financial & human resource. This paper aimed to provide useful information for sustainability of the VSU-AFTBI by looking at the success of the Southeast Asia's leading technology business incubator – The New Venture Institute (NVI) of Flinders University. It is argued that the Flinders University model carries important strategy lessons for strengthening VSU's AFTBI. The study reveals useful strategy that the NVI utilized, specifically the quadruple helix model that links academics, government, industry managers and citizens. The Service Design Model is suggested for VSU-AFTBI in its approach to the quadruple helix mode and the following recommendations are proposed: an immediate assessment needs to be made of the VSU's resources and capacity such as intellectual property valuation, technological readiness level, human capital resources and institutional capacity; a separate assessment of the business and community needs; participants and alumni need to be deeply engaged; student entrepreneurs need to be involved; and strengthened communication to improve brand and visibility. Although VSU's AFTBI and NVI have different specializations and locations, the tenets are presented here in general form and can be expected to work in the context of Philippine's VSU-AFTBI.

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1. INTRODUCTION

The Visayas State University is a government sponsored university situated in the province of Leyte in the Philippines. It specializes in agriculture studies and research and is widely regarded as the center of excellence in this field. For years it has contributed relevant scientific knowledge and technology in crop and livestock production, plant breeding, postharvest technologies, food processing and, most recently, biotechnology. One of the university's objectives is to build linkages with the national and international agencies for the promotion and transmission of knowledge in the communities especially in rural areas.

VSU is guided by its core values of relevance, integrity, truth and excellence as it fulfils its vision towards "becoming a competitive university for science, technology, and environmental conservation" and mission to develop "highly competitive human resource, cutting-edge scientific knowledge and innovative technologies for sustainable communities and environment".

Since 1978, the Visayas State University has led the Visayas Consortium for Agriculture, Aquatic and Natural Resources Program (ViCARP), a group of agencies whose mandate is to coordinate and manage agriculture and natural resource research and development in Eastern Visayas in the areas of production, processing, socio-economics, and communication.

However, the university is affected by recent trends in agricultural education. Enrolments in the agricultural courses have declined steadily over the last 10 years. This trend may be connected with a second issue, the slow translation of agriculture and food technologies to commercial products in the market. The latter trend is a reflection of VSU's limited capabilities in commercializing its intellectual property, a field of activity that it has come to only recently. To address this issue, VSU, in partnership with ViCARP, established the VSU-AFTBI (Agriculture and Food Technology Business Incubator) through funding from the Department of Science and Technology- Philippine Council for Agriculture, Aquatic and Natural Resources Research and Development (DOST-PCAARRD). The role of the council is to formulate policies, plans and programs for science and technology-based Research & Development with a view to assisting its commercialization. It also allocates government and external funds and also generates resources to support its program.

While the Council's support is valuable, another practical pathway for VSU to develop its commercialization capabilities is to learn from other successful incubators to help overcome its disadvantage of a lack of experience in business incubation. The Flinders University initiative can provide a sound model. It is in this light that this research is conducted.

Business Incubators are organizations that assist innovative start-up companies to accelerate business growth and success. They offer a range of business support and resources such as physical space, financial and technical services as well as networking connections. Generally, technology business incubators are established through public-private collaborations among universities, industries and all levels of government (Etzkowitz, 2003).

In 1986, Smilor and Gill first articulated the TBI concept as a bridge between technology, expertise, entrepreneurial talent, and capital (Milan, et.al, 2016). Its history can be traced back to 1951 with the establishment of a research park in California and in 1959 in New York's incubator program. Research of Kirchoff (1994) established the role of innovative small firms in employment and economic growth. This triggered the booming industry of incubation. The main purpose of TBI is to provide technology transfer and development leading to greater diffusion of products (EU, 2010). Another is to help start-ups by providing enabling linkages to help the new businesses survive, scale up, and grow (Mian, et.al, 2016). Its mechanisms is also viewed as important policy tools for supporting innovation and technology-oriented entrepreneurial growth. (Mian, et.al, 2016)

While there is general support for the use of TBI's in academe and business, there have been criticisms of their alleged failure to provide adequate protection for privacy of intellectual property and competitive strategies (McAdam & Marlow, 2007). Another criticism is that of Pena (2004) who concluded that business incubators are overrated as the services they offer are less important for success than factors specific to organizations, particularly the skills of the entrepreneurs who run them. The empirical evidence provided in his study suggests that there is a danger of the portion of new firms being nurtured in business incubation displacing and causing the exit of more efficient incumbent firms not receiving such policy support (Pena, 2004).

Notwithstanding these criticisms, technology business incubators today are considered one of the key instruments for building an innovation-based economy and a powerful tool for economic growth for both developed and developing countries. Incubators aid new venture firms as they extend business facilities (Allen & McCluskey, 1991); pool resources (OECD, 1997); attract investors; and provide professional support (Hannon & Chaplin, 2003) This works to the real

advantage of new ventures by enabling entrepreneurs to tap different support services in research and development. (Hannon & Chaplin, 2003).

The value of TBIs has been recognized in the Philippines where university-based technology business incubators are flourishing. Currently the Department of Science and Technology funds six (6) University based Technology Business Incubator. Visayas State University (VSU) is among the selected grantees. VSU's Agriculture and Food Technology Business incubation started in 2018 and is expected to be completed in 2020. Although the funding from the DOST will stop in 2020, VSU envisions AFTBI to be self-sustaining by then.

Generally, the purpose of this study is to draw lessons learned from the New Venture Institute's success and make use of those learnings in strengthening the newly established Agriculture and Food Technology Business Incubator in the Visayas State University. This requires studying NVI's system covering its programs & services, strategies, linkages and collaboration, and other initiatives. Knowledge gained is expected to provide useful recommendation in the VSU's Agriculture and Food Technology Business Incubator's sustainability.

2. METHODOLOGY

The research made used of interview and secondary data available in reputable website. The first stage was to review the various global rankings of successful university-based business incubation model. The UBI World Benchmark Study appeared best suited to this purpose. Results of the study was used to select the model for the VSU's AFTBI. The New Venture Institute of Flinders University was identified. Research on NVI then followed to understand its programs & services, strategies, linkages & collaboration, and other initiatives. An interview of the New Venture Institute Director, Mr. Matt Salier was conducted to supplement the information gathered. Recommendations in the context of VSU's AFTBI were then crafted based on scientific review and lessons learned from the NVI.

The UBI World Benchmark Study

UBI is a Stockholm-based data advisory firm that identifies common traits and best practices among innovation hubs across the globe. Its World Benchmark Study ranks and benchmarks university-linked business incubators and accelerators globally. The Study is "designed to identify distinguishing features of university-linked business incubators and accelerators and benchmark each program against industry averages." This is anchored in its research methodology

that sets comprehensive key performance indicators. Incubation programs are evaluated based on their impact and relative performance across three different dimensions: Value for Ecosystem, Value for Client Startups and Value for Program. Currently, the ranking and framework are based on twenty one (21) Key Performance Indicators (KPIs) with different weights scattered in 7 sub-categories. (See Table 1 & Figure 1). These KPIs were identified based on relevant research literature.

Table 1: The UBI Global Benchmark and Ranking Categories and Sub-categories (Castillo & Meyer, 2018)

3 Categories		
Value for Ecosystem	Value for Client Startups	Value for Program
<i>*Economy Enhancement</i>	<i>* Competence Development</i>	<i>* Program Attractiveness</i>
<ul style="list-style-type: none"> Jobs created & sustained (#) Sales revenue (\$*) Graduates (#) Self-generated revenue (\$*) 	<ul style="list-style-type: none"> Services offered (#) Coaching & mentoring hours (#) 	<ul style="list-style-type: none"> In-state applications (#, #/spot) Out-of-state applications (#, #/spot) Sponsorship attraction (\$)
<i>* Talent Retention</i>	<i>* Access to Funds</i>	<i>*Post-Graduation Performance</i>
<ul style="list-style-type: none"> Client startups accepted (#) Graduate retention (#, %) 	<ul style="list-style-type: none"> Total investment attracted (\$*) Average investment attracted (\$*) Seed funding attraction (#, %) 	<ul style="list-style-type: none"> 1-year survival rate (%) 5-year survival rate (%) High-growth enterprises (%) Qualified exits (#)
	<i>* Access to Network</i>	
	<ul style="list-style-type: none"> Partners (#) Events (#) Alumni engagement (#, %) 	

**7 Sub- Categories*

Some critics have argued that generalized theory may not be possible due to the idiosyncrasies of science parks, incubators (and accelerators) in relation to geographic, political, social, and economic systems Phan et al. (2005). However, the usefulness of the UBI oversight is evidenced from its international reputation

and is considered to be one of the most extensive rankings for university-linked business incubators and accelerators. (Castillo & Meyer, 2018). The UBI Global research framework assessment includes an encompassing evaluation of each incubator’s capacity to create value for the ecosystem, the clients start up and the incubation program itself.

21 KPIs (DIMENSIONS)	PERIOD (years)	UNIT	WEIGHT	7 SUBCATEGORIES	3 CATEGORIES	1 IPS	
1. Job created & Sustained (Workforce)	1	#	6.7%	1. Economy Enhancement (22.2%)	1. VALUE FOR ECOSYSTEM (33.3%)	Program Impact and Performance Score (100%)	
2. Sales revenue (Economic Output)	1	\$	6.7%				
3. Graduates (Economic Development)	5	#	4.4%				
4. Self generated revenue (Sustainability)	1	\$	4.4%				
5. Client startups accepted (Human Capital - short term)	1	#	6.7%				
6. Graduate retention (Human capital- long term)	5	#, %	4.4%				
7. Services offered (Support)	1	#	4.4%	3. Competence Development (8.9%)	2. VALUE FOR CLIENT STARTUPS (33.3%)		
8. Coaching and mentoring hours (Guidance)	1	#	4.4%				
9. Total investment attracted (Funding Total)	5	\$	6.7%	4. Access to Funds (11.1%)			
10. Average investment attracted (Funding- average)	5	\$	2.2%				
11. Seed funding attraction (Funding probability)	1	#, %	2.2%	5. Access to Network (13.3%)			
12. Partners (business development)	1	#	6.7%				
13. Events (Stakeholders engagement)	1	#	4.4%				
14. Engaged alumni (Peer support)	1	#, %	2.2%				
15. In- State applications (Reputation- local/regional)	1	#, #/spot	6.7%	6. Program Attractiveness (15.5%)			3. VALUE FOR INCUBATION PROGRAM (33.3%)
16. Out-of-state application (Reputation- national/global)	1	#, #/spot	4.4%				
17. Sponsorship attraction (Brand)	1	\$	4.4%	7. Post- Incubation Performance (17.8%)			
18. 1- year survival rate (Success-potential)	10	%	6.7%				
19. 5-year survival rate (Success-promise)	10	%	4.4%				
20. High growth enterprise (Success-evidence)	10	%	6.7%				
21. IPOs (Success- proof)	10	#	4.4%				

Figure 1. 2017-2018 Scoring framework for the UBI’s world benchmark study (Castillo & Meyer, 2018)

Value for Ecosystem – evaluates economic impact and performance of the incubation programs and their client and alumni start up. This includes assessment of programs successes in retaining human capital and startups in the ecosystem. This component is subcategorized into two, Economy Enhance and Talent Retention of which six KPIs were identified as performance measures for workforce, economic output, economic development, sustainability, human capital- short term, and graduate retention.

Value for client startups – assessment of the number of services and the efficiency of the program. There are three categories; competence development, access to funds and access to network and eight key performance indicators.

Value for incubation program – this component evaluates success in establishing agreements and third-party support as well as its “capacity to create viable companies”. Program Attractiveness and Post-Incubation Performance were identified as subcategory with a total of seven KPIs.

Why New Venture Institute?

Flinders’ University technology business incubation, called the New Venture Institute (NVI), gained worldwide recognition, being named twice (2017-2018 and 2019-2020) as the “Top Challenger” in Asia Pacific by UBI Global World Benchmark. This award is given to a university-linked incubation program that distinguishes itself among its peers because of its impressive overall impact and performance achievements relative to its respective regional peers. (UBI Global, 2018). The UBI global ranking results showed that, among the 1,370-university linked incubation all over 53 countries around the globe to be benchmarked, NVI was selected as the number one for the Asia-Pacific region. At present, it is the only Australian incubator to be recognised in global top rankings. In the Australia, it is ranked third in terms of number of assisted clients.

Clearly the NVI has an impeccable international reputation. Aside from this, NVI appeared to have features capable of being used to meet VSU’s requirements in strengthening its newly established Agriculture & Food technology business incubator.

3. RESULTS AND DISCUSSION

The New Ventures Institute (NVI)

The New Venture Institute serves as an entrepreneurial arm of Flinders University. NVI’s incubation and acceleration programs are geared towards developing innovative capabilities and supporting commercialisation drawing upon its core values of boldness, innovation and collaboration. These programs “focus on innovative education, SME and corporate innovation, and start-up incubation. Within South Australia these are delivered across the State’s capital city, Adelaide; the Limestone Coast region; Byron Bay; and soon, the Barossa Valley, Yorke Peninsula and Mid North regions”.

From its humble beginning in 2013, the NVI has already assisted 331 start-ups that have employed more than 100 people and raised five million dollars. At

the start of 2019, the NVI had trained over 3500 entrepreneurs and innovators (Kondaylas, 2019).

NVI Programs & Services

NVI offers high-end facilities and programs for entrepreneurs, businesses and students. It is strategically located an innovation district in the southern suburbs of Adelaide where it provides wide opportunities for both clients and students to access to the world class research, training and networks. Currently, it offers three broad programs—**Start up**, **Skill up** and **Scale up** that provide the following service for businesses, entrepreneurs and students.

Start-up Program

This program is designed to build basic understanding of business start-ups and future creativity and to apply innovation in business challenges. These programs are for beginners who are ready to test an idea, expand their network and build resilience.

The scope covers:

- The Pre-Accelerator Programs
- Flinders Innovation Centre
- SISA Visa
- Foment: Wine and Tourism Tech Accelerator

Skill Up Programs

These programs have been created to increase knowledge and improve mindsets by applying practical methodologies that will harness innovator skills. They are aimed at students and professionals and those who want to be mentors. The program offers a variety of innovation and enterprises courses through Flinders University including:

- Professional Certification (Innovation for Transformation)
- International Mission Trip
- Innovation and Enterprise courses at Flinders
- Learning Labs

Scale Up Programs

This program is intended for founders looking to grow their businesses desiring for growth and professionals aiming to be

leaders in innovation. It is suitable for anyone ready to scale up and learn from groundbreakingly international market. Includes:

- Flinders Enterprise Consulting
- Innovative Manufacturing Accelerators
- Welcome to eNVIision
- Innovation in Schools
- Shift.ed: Impact Venture Series
- Foment: Wine and Tourist Tech
- Accelerator

NVI Strategy

One of the strategies that NVI uses for business incubation is the Quadruple Helix Model (QHM). This model connects government, academe, industry and citizens. Although the research seeks to learn from NIV in an encompassing way, special attention is drawn to the tenets of Quadruple Helix Model. This paper argues that QHM strategy offers similar leverage for VSU-AFTBI such as that it brought to the Flinders University NVI. Hence the question is will be what it takes for the model to be successful in the VSU-ATTBI context? How did NIV apply the framework and how can VSU learn from it?

The **Quadruple Helix Model** originated from the triple helix concept which integrates three key stakeholders-- academe, industry and government--in fostering social and economic development. The triple helix model is based on the premise that academe, along with industry and government, can play an important role in development generally (Dzisah & Etkowitz, 2008) and specifically in university technology transfer (Klofsten et al., 2010; Urbano & Guerrero 2013).

In the quadruple helix model, an important element is added - the citizenry or community. Mulyana (2014) proposes the quadruple helix model not just for development generally but particularly as a “solution for the development of creativity, innovation and technology for the creative industry”. The Quadruple Helix theory, as written by Arknil et.al (2010) states that “a country’s economic structure lies on four pillars/helices which are the Academia, Firms, the Government and talented and productive User Community”.

This approach brings “multidisciplinary viewpoints together in an environment that promotes team work, collaboration and the sharing of ideas”. This model is expected to produce shared value that is beneficial for all levels of participation in the innovation ecosystem. Failure to involve citizens can lead to (1) products and service not used (2) lack of transparency (3) confusion between

innovators and end-users and lastly (4) frustrations (Värmland County Administrative Board, 2018).

Quadruple Helix Model

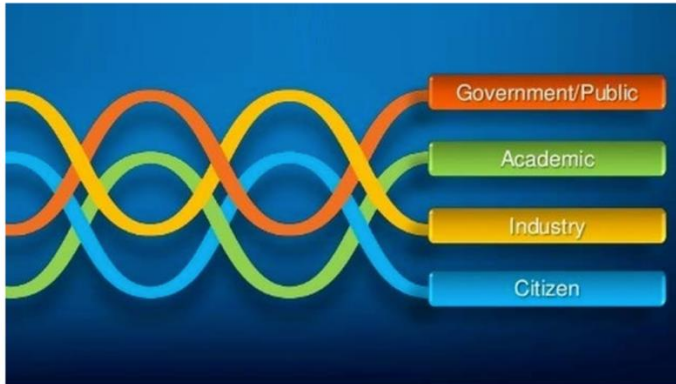


Figure 2: The Quadruple Helix Model used by NVI Flinders (Kondaylas, 2019)

Quadruple Helix model limitations and best practice

A comprehensive study by Arknil et al (2010) exploring Quadruple Helix presented good practices taken from good QH model cases. However, it is acknowledged however that there are limitations to this because of the cultural differences, goals, stages of development and resources availability such as funds and actors which can vary largely in different countries, regions and communities. This implies that it is almost impossible to have an unequivocal identification of good practice or recommendation. Rather a “contingency/configurational approach (Whittington et. al 2003) is needed, where there are several constellations of success, and the only “universalistic” recommendation is to enhance the regional interactive learning process” (Arknil et. al, 2010).

Listed below are the suggested good practices according to challenges raise: (Arknil et. al, 2010)

1. *Challenge: How to construct a QH type of innovation environment*
 - Good and approved guidelines and “check-list” for guiding the design and implementation of QH type of innovation co-

operation environment. Santoro and Conte (2009), created a guideline for living lab type of innovation environment. (See appendix A for check list).

2. *Challenge: How to avoid possible stumbling blocks of QH activities*
 - Common understanding and definition of QH innovation co-operation/environment
 - Open positive arena that is based on trusted partners
 - Roles of different QH partners should be described
 - Co-operation should be handled properly to prevent misunderstanding and disappointments on different sides. Importantly, equal levels of commitment need to be secured from all parties. Use of the QHM as a concept is not yet very well established or widely used in innovation research (Arknil et.al, 2010). This model also failed in the Uppsala Sweden for the innovation model in regional renewable energy initiative because of funding difficulties and stakeholders' communication lapses (García-Terán & Skoglund, 2018)
 - Communication strategy to strengthen brand and visibility of the QH environment created
 - QH developer organizations should also learn to identify the right users in relation to the type innovations they seek and target such groups for these innovations.
 - QH projects and activities are documented and reported well
 - A very important skill for QH developer organizations is the skill of motivating users
3. *Challenge: How SMEs can benefit from QH type of innovation activities*
 - Creating a living lab type of innovation organization and environment that offers services supporting users and user knowledge in their innovation activities.
 - In order to stimulate SMEs to work in more user-oriented ways and to involve users in their innovation activities, representatives of SMEs should be involved in research projects related to QH. They can then observe and get first-hand experience of how researchers plan and carry out user involvement in those projects. It is also important to train SME representatives to utilize different user involvement methods.

The Service Design model.

Although NIV used several approaches in its Quadruple Helix Model, one approach is suggested herein for the VSU-AFTBI for the sake of simplicity. That is Service Design model. The same method is used by Värmland County Administrative Board (2018). Service Design is innovative and global, both art and science (Katzan, Jr., 2011).

VSU can make use of the method and follow suggested activities as it strengthens AFTBI. It is important however that all QH actors are involve from the beginning of the process.

The Service Design is an iterative process where one can go back and forth depending on the lessons and the knowledge created along the way. (Värmland County Administrative Board, 2018)

1. Prepare – Defining the challenges and identifying the right problems. Needs to maintain contact with the end user to avoid incorrect assumptions
2. Explore – Identify the needs in greater focus
3. Understand – Understand the needs, usually involves tracing patterns and connections
4. Improve – Improve the solutions by expanding work and solutions, can be done through idea generation
5. Implement – Implement the solutions



Figure 3. Service Design Process illustration
(Värmland County Administrative Board, 2018)

TOOL	CAN BE USED TO:				
	Prepare	Explore	Understand	Improve	Implement
Brainstorming	X	X		X	
Co-creation		X	X	X	
Customer Journey		X	X		
Focus group		X	X	X	X
Hackathon				X	
Open Space		X	X	X	X
Personas			X		
Round-table Workshops		X	X	X	
Workshop	X	X	X	X	X

Figure 4. Activities that VSU-AFTBI can do in the conduct of the Service Design. (Värmland County Administrative Board, 2018)

The most frequently used tools are: Brainstorming, Co-creation, Focus Group, Open Space, Round-table workshops and workshop. Hence it is recommended that future AFTBI issue will be dealt with a mixture of the tools presented.

Activities are defined below as taken from Värmland County Administrative Board (2018).

Brainstorming encourages actors to think outside the box, generates as many ideas as possible and then evaluates it at the end of the session. It is normally conducted in an informal approach and seeks to generate creativity among team members. The aim of the brainstorming is to avoid criticizing by rewarding ideas and evaluating them at the end of the session.

Co-creation involves different stakeholders, especially the end-users/citizens in improving new products and services. Its main purpose is to solicit ideas that can be a part of the design process. This is done not just to hear voice but to empower those who gave it. It usually consists of two steps; contributions of experiences; and then selecting the most promising contributions.

Focus group is a small group of people whose reactions on a new product are studied and/or tested in guided or open discussions in order to determine the reactions that can be expected from a larger population. Questions are asked in an interactive group setting in which participants are free to talk with other group members. During this process, the researcher either takes notes or records the vital points he or she is getting from the group. Researchers should select members of the focus group carefully for effective and authoritative responses

Open Space Method is one way to enable all kinds of people (5-1000 participants), in any kind of organisation, to create inspired meetings and events. In Open Space meetings, the central theme is set in advance, but the participants create and manage their own agenda of parallel working sessions around a central theme of strategic importance. Events can take one day or longer.

Round-table workshop is a method for public participation or for groups of people who have an interest in a particular service or strategy. The Round-table workshop method enables participants to make a full contribution to discussions on issues of shared concern and to generate ideas for action. This method works well when there is a relatively clear topic to be discussed.

Workshop is a method where a group of people are actively participating. A workshop can serve multiple functions; provide a common understanding of a problem and find out challenges or bring new perspectives into the development process. Arranging a workshop takes planning in how you can engage the participants to create the most value; what can be done in different formats; informing the participants how you will follow up the workshop and what the next steps will be.

NVI Linkages & Collaboration & Other Initiatives

The approach of the New Venture Institute to involve end-users and improve stakeholder's cooperation is evident with its co-creation sessions which offer opportunities for experienced professionals to become mentors in group/s of entrepreneurs. The mentors enjoy personal fulfilment while they expand their networks through the NVI community. Mentorship application is easy as it is done through completing their online forms in its website. An allied strategy which Mr. Salier noted is the high number of alumni that remain engaged with the institute. He and his team persuaded some to even relocate to their Tonsley Innovation Centre after graduating from the program. This is an example of how NVI created a positive impact that is based on partners.

Another relationship building activity that proved effective is the PhD Speed Dating where big business meets big brains (NVI blog, 2014). The events help business men and women understand the capabilities of PhD candidates for peoples' business within a five-minute back-to-back date. The first event gathered 20 businesspeople and 20 PhD candidates at the University's Bedford Park Campus.

There are other takeaways for VSU from NIV's approach. One program that NIV created is the Education hac 4.0. - a collaborative, fun, fast-paced hackathon based on the challenges of future learning (NVI, 2019). Students-teachers teams interested in understanding future trends in education get invited from different schools. This leads to co-creation paving the way for better innovation. Mr. Salier said that, during the NVI's early years, they had a program where students become consultants in real projects. From the start, NIV set out to provide Flinders University students with an innovation and entrepreneurial experience and training that stimulates a culture of innovation and enterprise across the student body. These initiatives are aimed at avoiding QH stumbling block activities is identifying "the right users in relation to the type of innovations it seeks and the target group of these innovations."

In line with this, VSU's AFTBI can involve students in its innovation process in the same ways. With VSU's strength in agriculture and agricultural practices, collaboration among students and citizens, researchers and industry can lead to bigger project impacts that create a user-oriented innovation. Involving the students in the co-creation process addresses the main objectives of the VSU's AFTBI which is to establish a system that nurtures entrepreneurship venture of AANR students and graduates as well as researchers.

Given the number of graduate students in agriculture and food technology department in VSU, following this expert-to-entrepreneur dating concept in AFTBI will add value. Also, a communication strategy is needed to strengthen brand and visibility of the QH environment created. The QH projects and activities need to be properly documented and reported too. Recalling the case of Uppsala Sweden failure (stakeholders' communication lapses) in the study by García-Terán & Skoglund (2018) serves as a warning for managing QH approach. The NIV effort uses its documenting to promote the branding and visibility of its projects. It is therefore recommended that VSU-AFTBI maintain well documented exchanges between key stakeholders as a means of assisting actors to interact to enhance innovation. Also, it is equally important that AFTBI see to it that stakeholders are engage and motivated. (Värmland County Administrative Board, 2018).

For the small and medium enterprise sector, NIV was able to stimulate more user oriented and innovation-based activities. NIV was selected by the Australia Government's Department of Jobs and Small Businesses to handle the Entrepreneurship Facilitator Services 2019-2022 program which aims to encourage entrepreneurship and self-employment among South Australian residents. The grant recognises the use of good and effective different involvement methods for carrying out research plans.

Discussion with Director, Mr. Matt Salier

Mr. Salier attributed most of its success to the leverage of the seed investment that Flinders' University has made. The value of this investment was not only the dollars but also the clear signal it gave to potential investors of the university's long-term commitment to the NVI. Despite having only seven years' experience in the innovation and entrepreneurial sector, NIV has already gained worldwide recognition. Mr. Salier stressed the importance of the NVI's three guiding values - boldness, innovation, and collaboration. He explained that NVI's history began in 2013 when it created a "check-list" for guiding the design and implementation of the innovation environment it wanted to foster. That checklist included internally modelling Flinders' University existing successful venture capability and externally harnessing the University's intellectual horsepower through the business connections of the members of its governing body, the University Council. Stakeholder mapping was also identified by him as a crucial step in scoping industry's needs and matching some of those with what NIV has to offer. He argued that this was a necessary prerequisite for making NVI an anchored organization which drew upon its intellectual, physical and institutional strength. This contains important learnings for VSU-AFTBI. Mr. Salier made it clear that NVI would not have been able to establish such a firm foundation without starting to identify and expand industry partners almost from inception. Like NVI, VSU-AFTBI can draw upon many people in public sector authorities, agriculture and food industry, young entrepreneurs, citizens and students interested in Agri and Food entrepreneurship with the interest and expertise to make contributions.

4. CONCLUSION

AFTBI and New Venture Institute have different specializations; are situated in different locations; and have big differences in terms of its field. However, tenets presented are in general form and can be expected to work in the

context of Visayas State University's Agriculture and Food Technology Business Incubator. The success of the New Venture Institute gives Visayas States University some guidance in terms of its strategy, specifically utilizing the quadruple helix model that links intertwining role of the academic, government, industry and citizen. First, VSU should assess the schools' resources and capacity such as intellectual property valuation, technological readiness level, human capital resources and institutional capacity. Second, assess business and community needs in a more customer centric procedure leading to co-creation and innovation. Third, keeping an engaged participants and alumni to expand networks. Fourth, create involvement of students in an entrepreneurial, exciting and fun. Fifth, strengthen communication strategy to improve brand and visibility. For simplicity, AFTBI can make use of the Service Design Method in its approach to Quadruplex Helix Model. Some of the useful tools for this model includes Brainstorming, Co-creation, focus group, Open Space Method, Round-table workshop, and Workshop.

5. REFERENCES

- Allen, D., & McCluskey, R. (1991). Structure, Policy, Services, and Performance in the Business Incubator Industry. *Entrepreneurship: Theory & Practice*, 15(2), 61-77. doi:10.1177/104225879101500207.
- Arnkil, R., Järvensivu, A., Koski, P., & Piirainen, T. (2010). *Exploring the Quadruple Helix. Report of Quadruple Helix Research for the CLIQ Project*. Tampere, Finland: CLIQ Project.
- Castillo, J., & Meyer H. (2018). *World Ranking Reports 17/18*. Stockholm: UBI Global. Retrieved from <https://resources.ubiglobal.com/hubfs/Publications/Rankings/UBI%20Global%20Rankings%201718.pdf>.
- Dzisah, J., & Etkowitz, H. (2008). Triple Helix Circulation: The Heart of Innovation and Development. *International Journal of Technology Management and Sustainable Development*, 7(2), 101-115. doi:10.1386/ijtm.7.2.101_1.
- Etkowitz, H. (2003). Innovation in Innovation: The Triple Helix of University-Industry-Government Relations. *Social Science Information* 42(3), 293-337. doi:10.1177/05390184030423002.
- European Commission. (2010). *The Smart Guide to Innovation-Based Incubators (IBI) European Union Regional Policy Report*. Retrieved from https://ec.europa.eu/regional_policy/en/information/publications/evaluat

ions-guidance-documents/2010/the-smart-guide-to-innovation-based-incubators-ibi.

- García-Terán, J., & Skoglund, A. (2018). A Processual Approach for the Quadruple Helix Model: The Case of a Regional Project in Uppsala. *Journal of the Knowledge Economy*, 10(3), 1272-1296. doi: 10.1007/s13132-018-0521-5.
- Hannon, P., & Chaplin P. (2003). Are Incubators Good for Business? Understanding Incubation Practice- The Challenges for Policy. *Environment and Planning, Government & Policy*, 21(6), 861-881. doi: 10.1068/c0215
- Katzan, Jr., H. (2011). Essentials Of Service Design. *Journal of Service Science*, 4(2), 43-60. doi 10.19030/jss.v4i2.6644.
- Kirchhoff, B.A., (1994). *Entrepreneurship and Dynamic Capitalism: the Economics of Business Firm Formation and Growth*. Westport, Conn.: Praeger.
- Klofsten, M., Heydebreck, P., and Jones-Evans, D. (2009). Transferring good practice beyond organizational borders: Lessons from transferring an entrepreneurship programme. *Regional Studies*, 44 (6), 791-799. doi: 10.1080/00343400903095238.
- Kondaylas, L. (2019). New Ventures Institute Innovation in Regional South Australia. Retrieved from <https://www.yorkeandmidnorth.com.au/wp-content/uploads/2019/03/Laki-Kondylas- Flinders-University.pdf>
- Mcadam, M., & Marlow, S. (2007). Building Futures or Stealing Secrets? *International Small Business Journal: Researching Entrepreneurship*, 25(4), 361-382. doi: 10.1177/0266242607078563.
- Milan, S., Lamine W., & Fayolle, A. (2016) Technology Business Incubation: An overview of the state of knowledge. *Technovation*, (50-51), 1-12. doi:10.1016/j.technovation.2016.02.005.
- Mulyana, S. (2014). Improving the Capability of Innovation, Competitive Advantage and Performance through the Helix Quadruple Approach: Study in the Fashion Sector Creative Industry. *Journal of Technology Management*, 13(3), 304-321. doi: <https://doi.org/10.12695/jmt>.
- New Venture Institute. (2019). Retrieved from <https://www.nviflinders.com.au/mentoring/Research, Work Research Centre>.
- New Venture Institute named best university incubator in Asia-Pacific – News. (2019). Retrieved from <https://news.flinders.edu.au/blog/2018/02/24/new-venture-institute-named-global-leader-startup-success/>.

- New Ventures Institute (2019) Education Hack 4.0 | Flinders New Venture Institute and Cisco. Retrieved from <https://www.nviflinders.com.au/eduhack-wrap/>.
- OECD (1997). Technology incubators: Nurturing small firms. OECD No: Issue Paris. Outlining user-oriented innovation models. University of Tampere, Institute for Social.
- Pena, I. (2004). Business Incubation Centres and New Firm Growth in the Basque Country. *Small Business Economics*, 22(3/4), 223-236. doi:10.1023/b:sbej.0000022221.03667.82.
- Phan, P., Siegel, D., & Wright, M. (2005). Science parks and incubators: observations, synthesis and future research. *Journal of Business Venturing*, 20(2): 165–182. doi:10.1016/j.jbusvent.2003.12.001.
- Smilor, R., & Gill, M., (1986). *The New Business Incubator: Linking Talent, Technology, Capital and Know-how*. Lexington Books, Lexington, MA, p. 224.
- UBI Global (2018) Awards: Most Promising & Top Challengers – 2017/2018. Retrieved from <https://ubi-global.com/awards-mp-tc-1718/02/>.
- Urbano, D., & Guerrero, M. (2013) Entrepreneurial Universities: Socioeconomic Impacts of Academic Entrepreneurship in a European Region. *Economic Development Quarterly*, 27 (1), 40-55. doi: 10.1177/0891242412471973.
- Värmland County Administrative Board (2018). A Quadruple Helix guide for innovations. In For Care. European Regional Development Plan. Retrieved from <https://northsearegion.eu/media/5326/quadruple-helix-guide-version-20180612.pdf>.
- Visayas State University (2019). The University | Visayas State University. Retrieved from <https://www.vsu.edu.ph/about/overview>
- Whittington, R., & Pettigrew A. M. (2003). Complementaries Thinking. In A.M. Pettigrew, R.
- Whittington, L. Melin, C.J. Sanchez-Rundle, F.A. J. van den Bosch, W. Ruigrok & T. Numagami (Eds.), *Innovative forms of Organizing* (pp 125-132). London Sage.