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University Outreach in the Triple Helix Model of Collaboration for Entrepreneurial Development

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Abstract

This paper presents an empirical study of the role of university outreach in the triple helix collaboration model adopted for the development of knowledge-based entrepreneurship in a community enterprise in Thailand. The triple helix model is a hybrid collaboration of university-industry-government networks for knowledge transfer and innovation development. This research project was a case study using a qualitative ground theory approach, semi-structured interviews, and documentary analysis for its data collection tools. This study investigates how a university outreach project performed by academic members of a regional university from the Northeast region of Thailand plays a role in promoting a local community enterprise to become knowledge-based entrepreneurship. The study chose a local organic rice farming community enterprise as its case study. The study discovered that the primary role of the university outreach is a source of creative knowledge required for innovative development. The knowledge delivery is via academic service financially supported by funding from a government agency. The empirical evidence showed that the participating academics delivered their knowledge service with sufficient entrepreneurial skills. Moreover, the academic service that promoted the enterprise's business innovation significantly added economic value to its production. In addition to identifying success factors, this paper also discusses a challenge for further development for the university outreach sustaining its contribution to the triple helix collaboration by constructing systematic support from the university and promoting academic integrity for interdisciplinary research-based innovation development.

Keywords: Community enterprise, Knowledge-based entrepreneurship, Thailand, Triple helix model, University outreach

1. Introduction

Universities play a vital role in promoting economic growth by delivering academic services. Economic development concepts in recent eras, such as the knowledge-based economy and the industry 4.0 economy, focusing on innovation development require new knowledge creation as an essential element of the development (Foray & Lundvall, 2009). The works of academia involving servicing the surrounding economic and societal needs are delivered in various forms, known as regional engagement (Benneworth & Sanderson, 2009), community service (Antonio et al., 2000), public service (Olo et al., 2019), research collaboration (Mensah & Enu-Kwesi, 2018) and outreach activity (Egeren & Laurie, 2022). These activities help promote entrepreneurial development in production and add economic value (Olo et al., 2019). Thailand's recent national economic development concept focuses on innovation development, known as Thailand 4.0 (Jones & Pimdee, 2017). Universities are expected to contribute to economic growth by servicing the knowledge in response to business and production needs. This paper presents an empirical study looking into the role of university outreach in engaging with a community enterprise to promote its entrepreneurial development.

The study this paper presents is a further investigation based on empirical evidence of innovative entrepreneurial development of an organic rice farming community enterprise from Thailand delivered by (Chanthes, 2021). The study revealed that one of the essential success factors of the selected case development toward innovative entrepreneurship is support for innovation development acquired through a university outreach served by a regional university. That is, the outreach facilitated the knowledge exchange network leading to the creation of new knowledge required to develop the enterprise. In addition, the outreach also helped the enterprise gain access to necessary services provided by public agencies working to implement the national organic extension policy. The identified outreach activities involved three parties: the enterprise, the university, and the government agencies. These findings laid a foundation for further investigation on how the university outreach played roles in the tri-lateral interactions for innovation development, known as the triple helix model of collaboration (Etzkowitz & Zhou, 2017), practically adopted for promoting the business innovation of this community enterprise, see Figure 1:

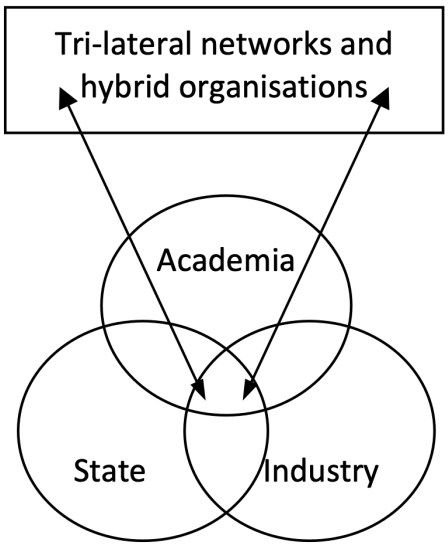

Figure 1. The triple helix model (Etzkowitz & Leydesdorff, 2000)

Given the outline of the triple helix model as in Figure 1, this paper focuses on developing networks and hybrid organizations for collaborative university outreach activities to promote the business innovation of the studied community enterprise.

According to Chanthes (2021), the business competitiveness of organic farming production in Thailand is market-focused. Her empirical evidence showed that farmers deciding to change from traditional rice farming using chemical substances to organic farming were motivated by the higher market value of organic products. However, agree with Chouichom and Yamao (2010) and that the increasing market values come with inevitably higher costs and challenges for production and business management. That is, innovation development for organic farming and production requires sufficient new knowledge in various areas ranging from production technology, marketing, and financial and business management (Chanthes & Sriboonlue, 2021). Therefore, to further comprehensively scrutinized the outreach activities involving the innovation and entrepreneurship development with market-focused, the researcher adopted a model of production with market-focused technology development system by Terziev (2016), as outlined in Figure 2 below:

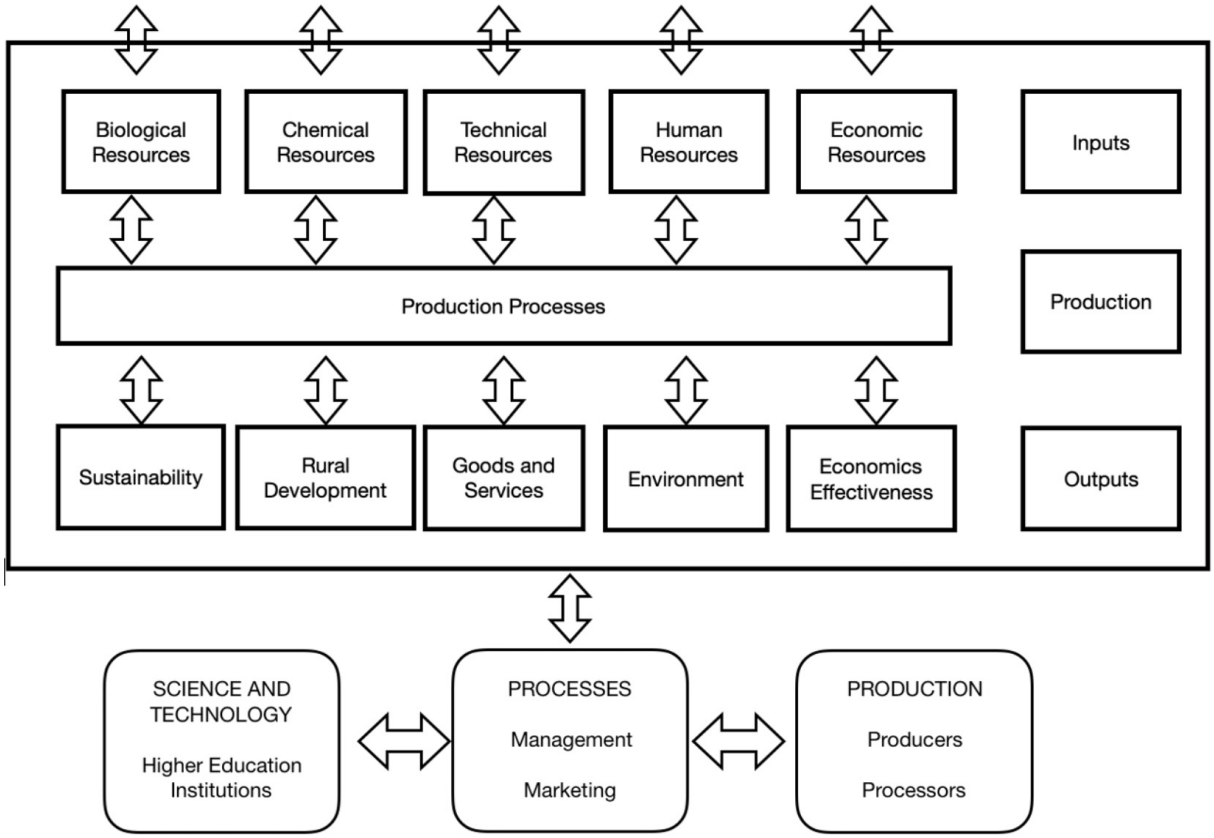

Figure 2. A model of production with the market-focused technology development system (Terziev, 2016)

Given the research motivation as introduced, the empirical study of this paper was a case study of a selected organic rice farming community enterprise from Thailand. The central focus of the investigation was the university outreach playing a role in the tri-lateral collaboration for innovation development in the selected case. Considering the research focus, the unit of analysis of this research was outreach activities involved with the business innovation and the entrepreneurial development of the studied enterprise. The following section explains the methodology of the study.

2. Research Method and Data

2.1 The Case Study Design

The researcher adopted the model illustrated in Figure 2 to form the scope of investigative facets, known as the case study's bounded system (Merriam & Tisdell, 2015), to include elements of development, namely inputs, production, and outputs of the organic rice production. That is, the study did not limit the analysis to technology development; it also considered the innovation development involving all the critical elements identified in the model. In terms of inputs, the study investigated biological, chemical, resources, technical, human, and economic resources. For the production, it scrutinized the production processes.

Finally, looking into the outputs, the researcher examined the outreach activities in terms of sustainability, rural development, goods and services, environment and economic effectiveness of the outputs resulting from the outreach activities under the investigation. Figure 3 below outlines the bounded system of this case study, as guided by the triple helix model by Etzkowitz and Leydesdorff (2000) essential elements for the market-focused development system by Terziev (2016) and organic farming production procedures for innovative entrepreneurship development by Chanthes (2021).

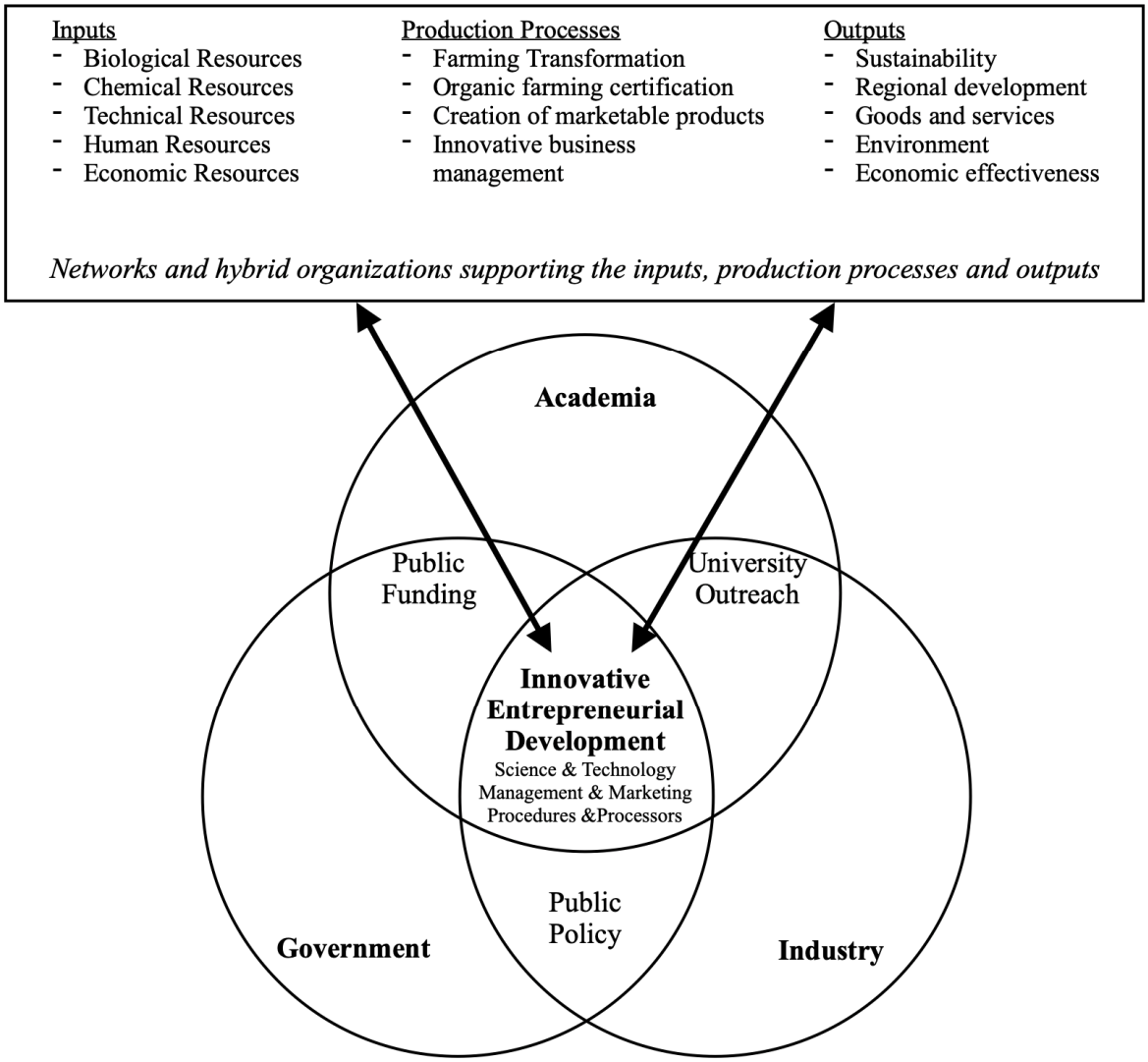

Figure 3. The bounded system of the case study (developed by the author)

2.2 Documentary Analysis

Given the case's bounded system, as clarified in Figure 3, the researcher employed a qualitative research approach to allow rich and detailing multifaceted investigative elements

(Patton, 2002). The research data was collected using documentary analysis and semi-structured interviews. The reviewed documents providing secondary research data included focus group interview transcripts from a study by Chanthes (2021), which motivated the investigation of this research, and government documents relating to Thailand's national organic agricultural extension policy. The focus group interview employed by Chanthes (2021) was conducted in February 2021. It used open-ended questions to ask five interview participants purposively selected from the population of 47 members of the selected enterprise. The five participants were selected according to their roles and contributions to the operation of the community enterprise. As a result, the selected participants included the community enterprise's leader, the bookkeeper, a senior founding member, a non-founding senior member and a junior member working as an assistant to the leader. The transcript of the focus group interview with the members was used as secondary research data together with other documents from various sources, including related government documents and official websites of national and local government agencies (Department of Small and Micro Community Enterprises Development, 2020; Ministry of Commerce of Thailand, 2017; Rice Department, 2021).

2.3 In-depth Interviews

In addition to the secondary research data as stated above, the focus group transcript guided the researcher to revisit the case site to perform in-depth interviews with the three former participants as they had direct experience collaborating with university outreach activities. The three selected members for the additional interviews were the leader, the bookkeeper, and the assistant to the leader. The reviewed transcript also guided the researcher to invite two academics from a regional university identified as the project leaders of the projects regarded as the university outreach in collaboration with this community enterprise. In summary, the primary research data was collected using in-depth interviews with three members from the community enterprise and two academics from the regional university having previous experiences working together for the university outreach delivered to the enterprise. The interviews were carried out in October 2021.

2.4 Qualitative Content Analysis

The data analysis method was qualitative content analysis. The technique allowed the researcher to subjectively interpreted the content of the primary and secondary data collected (Creswell & Poth, 2016). The researcher analyzed the data by systematically classifying the data into codes and then identified the patterns of themes to explain the relationships of the developed codes. The explanatory themes were developed within the identified boundary for investigation (Merriam & Tisdell, 2015), as presented in Figure 3 above. As a result, the research findings were delivered to explain the role of university outreach in the triple helix collaboration model to promote the entrepreneurship development of the selected case, as presented in the following section.

3. Findings

3.1 Innovative Entrepreneurial Development in Organic Rice Farming

3.1.1 Market-Focused Product Development

The empirical case site of this study was a rural town in the Northeast region of Thailand. Farmers in this community previously produced rice using chemical pesticides and fertilizers, the typical farming technique widely used throughout the country. However, the motivation for transforming from traditional production to certified farming started in 2014 when the community leader joined a government program for agricultural development known as "Thai Kem Kang," meaning stronger Thailand. The program aimed to promote national economic growth by adding value to agricultural production with innovation and creativity, a concept rooted in the national economic development policy known as Thailand 4.0. The leader agreed to join the program, so she started the community enterprise, initially membered by a group of 24 farmers in the area. In 2021, when this study was carried out, this community enterprise grew to 47 members. Initial funding for establishing the organic rice farming community enterprise was granted from the aforementioned government program.

The community enterprise had a clear objective for its business to increase market value for its rice product with standardized farming and certified organic production. As a result, they need new knowledge for not only the production transformation but also the entrepreneurial development with market-focused. As the leader stated:

> "*Nothing was easy for the transformation. We were told [by the Thai Kem Kang staff] that the high-quality organic rice market was growing nationally and internationally. We wanted to be in that market, but we had little knowledge of getting there. We needed to make many changes, from the farming technique to how we approach the market. It took us five years for our farming to be certified. Still, I consider we are not yet achieving business success.*"

3.1.2 Innovative Production

Despite insufficient knowledge from the beginning, the studied enterprise received knowledge support through knowledge networks from government agencies at both central and regional levels. The research findings showed that public support was part of the national agricultural extension policy. This support significantly helped the farmers gain new knowledge on rules and regulations for organic production, successfully registering their products and granting organic certification. This type of public support is considered the success factor for product innovation.

In addition to public support, required knowledge for innovation development was also delivered through academic services delivered by a regional university. Academic staff from the university offered knowledge delivery through outreach projects in various areas ranging from rice production to business development. These activities were part of the university's mission for regional engagement, which the university financially supported.

Given that the enterprise was connected with government entities and the regional university

while developing its business, research findings showed that hybrid networks were also developed. The collaboration was developed because the enterprise participated in the outreach activities while receiving public support under the government policy for organic agricultural extension. As a result, elements of the triple helix model of collaboration were found through the entrepreneurship development of this studied enterprise. The following section presents the roles of the university outreach in the discovered collaborations.

3.2 Roles of the University Outreach in the Triple Helix Collaboration

Bearing in mind the bounded system for investigation of this case study, as outlined in Figure 3 earlier, the scrutinization of the roles of university outreach delivered to promote the entrepreneurial development of the selected case was divided into three parts: the inputs, the process and the outputs of the business. The research findings are presented in this section.

3.2.1 Promoting the Inputs

The inputs of market-focused organic production refer to resources for the business operation or organic rice farming for this case study. The evidence from this case showed university outreach involving innovative development of all preidentified input types, namely biological, chemical, technical, human, and economic resources, see Table 1 below:

Table 1. University outreach in the innovation development of the business inputs

Input Type	Roles of University Outreach
Biological resources	Delivery of new knowledge for organic production standards and advanced farming techniques for replacing chemical usage in farming.
Chemical reources	
Technical resources	Provision of training on using advanced agricultural machines.
Human resources	Provision of training on skill improvements for business management. Provision of training on skill improvements for organic farming.
Econmic resources	Offering assistance for proposal writing that leads to the success of applications for public grants and successful admissions to government agricultural extension programs.

3.2.2 Promoting the Production

As reported by the empirical evidence, university outreach activities were delivered to promote the processes for product development, concerning that the founded community enterprise was attempting to gain competitiveness in the organic farming and production market. Based on the analytical framework outlined in Figure 3, all four identified elements of business transformation were found to engage with the university outreach offered by the regional university. These elements found were (1) farming transformation, (2) organic farming certification, (3) creation of marketable products and (4) innovative business

management.

For the first two elements, which required additional technical knowledge for production, members of the enterprise gained the knowledge from national and regional government agencies responsible for the national agricultural extension initially introduced to them by the Thai Kem Kang staff. They had maintained the networks since the community enterprise was founded. The critical success for maintaining the network was the trustworthiness they had built up over time to perform high standardized organic production practices strictly. As a result, with the good connections, the enterprise also gained access to public promotional programs for organic production. As an interviewed member asserted:

> "*From the beginning, we are firmly determined to the change. We strictly followed the authorities' instructions to be certified as an organic producer. Even after being granted the certificate, we have been inspecting from time to time. We, therefore, need to maintain the production standards. We strictly admit new members who only show their readiness to join the community enterprise, not just in terms of sufficient resources but also the knowledge and good attitudes towards what we are doing. With the good practice and reputation, we often get offered or selected for joining government programs or financial aid schemes for organic production.*"

Given the statement above, the good practice and the excellent reputation not only attract the attention of government authorities but also academics from the region seeking to engage with the regional development. As a result, academics from two Schools of the engaged university, the School of Engineering and the School of Management Sciences, offered academic services to the enterprise. These academics served required knowledge and offered a training program to enhance the members' skills to promote the production ability required to the conditions of the grant or aid schemes this farming enterprise joined. These collaborative activities also led to the creation of marketable products and innovative business management. As the leader stated:

> "*We have learnt much from joining those programs [by the government authorities]. Now we start thinking about moving further. Those academics help us with almost everything we need to grow the business. For example, they help us plan on registering as a limited company. They help train us in accounting and financial management. They also help register the products to be certified by the FDA [Food and Drug Administration of Thailand]. We had very little knowledge of doing these things. These academics help smooth this completed procedure.*"

3.2.3 Promoting the Outputs

In terms of the promotion for outputs, as outlined in Figure 3, only one aspect was found as empirical evidence of the university outreach's role in helping the promotion. The identified aspect was goods and services, which is related to the university's role in promoting the creation of marketable products, as presented earlier. Although the university outreach played a significant role in promoting the inputs and the processes of the business, the evidence showed a lack of activities to promote the business sustainability explicitly. The knowledge

services delivered mostly responded to the needs raised during the collaboration. Furthermore, despite the academic services promoting business growth that could eventually contribute to regional development, this possible impact was not much the focus. The evidence showed that academic services were usually perceived as the third mission of academic work. Unlike undertaking a research project, participating academics often undertook such outreach as short-term projects with little financial support from the university. As a result, challenges were identified for further development concerning (1) sustainability, (2) regional development, (3) environment and (4) economic effectiveness. These concerns are indicated in the literature (Puangpronpitag, 2019; Terziev, 2016) as essential features for innovation development in organic promotion.

4. Discussions

4.1 University Outreach in the Triple Helix Collaboration

Given the empirical evidence of the studied organic rice community enterprise, innovative entrepreneurial development can be promoted through the triple helix model of collaboration. As presented in the research findings, the study provided evidence that tri-lateral networks and hybrid organizations of innovation development can be undertaken in the form of activities supporting new knowledge creation and exchange through the collaborative project. For the studied community enterprise whose business involve the production and distribution of certified organic rice from the enterprise's members, such networks, and organizations for promoting the business innovation were evidently identified. As a result, innovative entrepreneurship was promoted through the inputs, production processes and the outputs of the organic rice they supplied to the effectively meet the market expectations.

The essential success factor of the university outreach that effectively promotes the business innovation of this community enterprise is the entrepreneurial ability of the academics from the participating university. The significance of being an entrepreneurial university reported as a vital element for successful outreach agrees with previous studies conducted in Thailand (Chanthes, 2012) and other countries in the more developed systems such as European countries (Crudu, 2019; Kalar & Antoncic, 2015). Furthermore, another essential success factor reported by this study's finding is the importance of not only formal but also informal connections between the leader of the local enterprise with the regional university and public authorities. This evidence agrees with Puangpronpitag (2019) whose study compared the triple helix model implementation in the regional engagement of Thai and UK universities. It also agrees with Puangpronpitag (2019) that the existing informal connections create trust between the collaborative parties; the trust helps stimulate the knowledge exchange, the new knowledge creation and the mutual understanding of innovation development required to deal with the challenges the business is facing.

4.2 Challenges for Sustaining the Collaboration

Given the research findings, this paper also identifies critical challenges for sustaining the university outreach in the initiated networks and collaborations. This challenge involves the requirement for systematic and formal university support for outreach delivery. As reported in

the findings, outreach activities were mainly delivered as part of an academic service project, often recognized as community service. The academic services found in this research were lack of academic integrity across diverse disciplines. As reported in the findings, academic services for promoting the business's marketing, management and accounting system were delivered by academics from the university's Business School. Other academics from the School of Engineering provided other services for improving the production technologies. The academics from the different disciplines had no connections in providing their academic services to this community enterprise.

As a result, there was a critical area for improvement of the university outreach concerning academic integrity, and multidisciplinary outreach is recommended for problems-oriented and research-based innovation development (Etzkowitz & Leydesdorff, 2000; Mensah & Enu-Kwesi, 2018). Furthermore, to sustain the collaboration, previous studies from the Thailand context (Chanthes, 2012) and other developed countries (Egeren & Laurie, 2022; Mensah & Enu-Kwesi, 2018) suggest university outreach being carried out as research collaboration. The research-based innovation development can sustain the initiated networks and related collaborative organizations (Etzkowitz & Zhou, 2017).

5. Conclusion, Research Limitations and Suggestions for Future Studies

5.1 Conclusion of the Study

This paper has presented an empirical case study of an organic rice farming community enterprise in the Northeast region of Thailand. The researcher employed a qualitative approach to investigate how university outreach plays a role in the triple helix collaboration model for promoting the entrepreneurial development of this local enterprise. The researcher collected the data using documentary analysis and in-depth interviews and analyzed it using the qualitative content analysis technique and focusing on outreach activities as the unit of analysis. The findings showed that university outreach activities helped promote the entrepreneurial development of the studied enterprise as they tried to enhance their competitiveness with innovation. With the assistance of the outreach delivery, this business organization operated by a group of local farmers could implement related business innovation into their input, processes, and outputs of the business.

Elements of the triple helix collaboration were found in the studied case. That is, tri-lateral networks of university-industry-government relations were found as academics from regional universities provide knowledge services to help promote the business. Such activities received financial support from diverse sources, including the participating universities and government agencies at national and regional levels. Reported activities supported innovation development in the 'inputs' of the organic rice production of this case study; these activities involved helping the enterprise obtain the organic production certification. The activities relating to the 'processes' of the business included introducing advanced production equipment such as the innovative machine for assorting and classifying the rice. Additionally, there were knowledge services on modern trade and business registration. Finally, activities to promote the 'outputs' involved implementing innovative business management. These activities included training in using accounting software packages, modern trade and

e-commerce and online marketing and product distribution via online business platforms.

While securitizing the collaborative activities, the researcher also found an important challenge for the university outreach delivery; the outreach delivered was lack of multidisciplinary integrity. Concerning that organic farming and production were the focus of the current national economic development policy, public expectations for academic services to engage with this sector increased. Academics from different disciplines offered their knowledge services without collaboration across disciplines. This finding was acknowledged as a challenge for optimizing resource management and sustaining the initiated cooperation.

5.2 Research Limitations

This paper has delivered empirical evidence and discussions on the findings for further theoretical and practical implementation of the triple helix collaborative model. However, there are several limitations to be borne in mind. The first limitation involved the qualitative approach employed for the case study investigation. This research approach inevitably included the researcher's subjective interpretation and biases as she attempted to make sense of the inquiry into the case study (Patton, 2002).

Notwithstanding, the limitation did not devalue the findings this paper has delivered. The research increased the exemplifying quality and explanatory function of the research outcomes by constantly comparing and discussing the emerging codes and conceptual ideas with those already discussed in the literature and previous studies. This action was undertaken throughout the research process. The constant revisitation of the related literature helped with theoretical and practical discussions of the findings (Tight et al., 2016; Yin, 2017). As a result, despite the investigation being bounded within the case's boundary, the research outcomes could be implemented in a broader range of contexts by focusing on the academic concepts of the investigation. For this study, the identified concepts included the role of university outreach in the triple helix model and the entrepreneurial development of small businesses such as community enterprises. Based on these identified concepts, suggestions for future studies are provided below.

5.3 Suggestions for Future Studies

The unit of analysis of this case study was outreach activities reported in two data sources. One is the secondary data from the focus group interview transcripts of the former project by Chanthes (2021), which led to the conduct of this study; another was the primary data from the in-depth interviews with the selected participants. As the findings showed, outreach activities were lack of multidisciplinary academic integrity and research-based service delivery. However, multiple previous studies suggest multidisciplinary networks as success factors for innovation development (Kalar & Antoncic, 2015; Olo et al., 2019). Additionally, a previous study in the Thailand context conducted by Chanthes (2012) and Nakwa & Zawdie (2016) confirms that research-based collaboration can promote the sustainability of collaboration and the academic productivity of the participating academics. This paper, therefore, recommends future studies to investigate the role of university outreach in promoting entrepreneurial development in local businesses from academics' perspectives. In

this sense, it suggests explicitly future research to focus on how research-based outreach can be developed to promote the triple helix collaboration for innovation development in small businesses. Given the exemplifying quality and the explanatory function of this case study, as clarified earlier, these recommendations are not limited to the Thailand context or the organic rice industry only; rather, these recommendations may lay an investigative assumption for studies in the broader range of industries and countries.

Acknowledgments

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