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Research Article

Significant Contributions of University Business Incubators in Enhancing the BusinessGraduates' Employability and Technopreneurship

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ABSTRACT

This study determined the significant contributions of university business incubators (UBIs) in selected higher education institutions in Region II to the business graduates' employability and technopreneurship. The study also highlights the present situation of the UBIs and the involvement of the business graduates. The method used in the study were mixed quantitative and qualitative analysis.Data were gathered through the administration of a researcher-made questionnaire, interviews, and focus group discussions. Moreover, descriptive statistics were used for the quantitative part, while thematic analysis using in-vivo and free coding was used for the qualitative part. Results revealed that the UBIs under study have adequate facilities and services, develop utility models and seek patents for innovations, assist technopreneurs, start-ups, and businesses, and develop products for different industries. Best practices and challenges were also identified. Involvement with UBIs by business students was self-perceived as high extent, while BI personnel perceived it as low extent. The results led to the development of the UBI's significant contribution model in enhancing the knowledge and skills of the business graduates' employability and technopreneurship. It is pinpointed that BIs can enhance the learning experience of business students through immersion, including it in the development or enhancement of curricula, and developing clear policies and guidelines will benefit business students and other stakeholders.

Keywords: *entrepreneurial universities, technology transfer, university-based incubator*

Background

The relationship between universities and business incubators is essential because universities are a source of knowledge, research, and resources, as well as today's innovation-driven centers. The affiliation or

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management of a BI program within a university represents a significant advantage for entrepreneurs, as these institutions can provide links to industry, society, andgovernment entities (Hassan, 2020).

Governments worldwide have adopted policies focusing on technology advancement in their economic policy. In the Philippines, there are many incubators where innovative ideas arepromoted and supported towards commercialization. Like other BIs worldwide, those in the Philippines have three significant objectives: creating jobs, developing entrepreneurs, and promoting public-private partnerships in regional economic development (DOST-PCIEERD, 2014).

Northern Luzon state universities have already created and established their business incubators to support the innovation and entrepreneurship of students and other clients, such as the Sabatan Technopreneurs' Hub of the Nueva Vizcaya State University (NVSU); Business Incubation Zone for Novel and Sustainable Enterprises (BIZNEST) of theCagayan State University (CSU); and Cagayan

Valley Cacao Development Center (CVCDC) of Isabela State University (ISU), respectively.

Foo & Turner (2019) theoretically revealed a more generic role of education providers and BIs in preparing learners for entrepreneurship. It has highlighted three key areas in BIs that will affect the journey of entrepreneurial learning, namely, the structural capital (the operational part), human capital (expertise and managers), and social capital (business networks), and revealed the importance of mentors or coaches in fostering entrepreneuriallearning.

This research determined the present situation of university business incubators (UBIs) in selected universities in Region 2, the involvement of business graduates in the UBIs,and the significant contributions of UBIs inenhancing the business graduates' employability and technopreneurship using Foo & Turner's framework.

Methods

Research Design

The descriptive research design was used in this study. With this method, the researcher was provided with descriptive information about the present situation of the university business incubators and the involvement of the business graduates of the three prominent universities in Northern Luzon.

Primary data sources include surveysconducted online via google forms, and in- person interviews via zoom meetings with the project leaders and staff of the university business incubators. Meanwhile, secondary sources include university websites, journals, and research outputs.

Research Environment

The participants came from business schools inthe Cagayan Valley Region, Region 2. Among the six state universities in the region, only the three prominent state universities were considered as the locale of the study as they both offered BSBA courses and carry out technology transfer or business incubators namely: Nueva Vizcaya State University (NVSU) – Bayombong Campus, Isabela State University (ISU) – Echague campus, andCagayan State University (CSU) – Andrewscampus, respectively.

Research Participants

The key informants in this study were the business graduates of SY 2018-2019, SY 2019-2020, and SY 2020-2021 who completed their BSBA degree in NVSU, ISU, and CSU; and the business incubator personnel (director,project leader, manager, staff) of the NVSU- Sabatan Technopreneurs Hub, ISU-Cagayan Valley Cacao Development Center (CVCDC), and CSU-Business Incubation Zone for Novel and Sustainable Technology Enterprises (BIZNEST).

Research Instrument

A self-made questionnaire was the primary instrument for collecting the essential information for this research study. To ensure its validity, the developed survey questionnairewas subjected to several refinement phases andan item review by a panel of experts.

The survey instrument was subjected to tryout data gathering on 46 business graduates from PLT College Inc. (PLTCI) and Saint Mary's University (SMU) via google forms to establish its reliability. Data were analyzed using an SPSS

reliability check for internal consistency. The overall computed alpha coefficient is 0.985 for the business graduates while 0.981 for the BI personnel, which means that both instruments are highly reliable. The following table summarizes the results of the computation.

Table 1. The Reliability Statistics Using Cronbach's Alpha

Participants	Cronbach's Alpha	N of Items
Business Graduates	.985	31
BIC Representatives	.981	31

Data Gathering Procedure

Surveys, observations, interviews, and documentary scanning were used to collect data for this study with the assistance of the University President, the Vice President for Academic Affairs, the Vice President for Research and Extension, and the University Business Incubator Personnel of the three HEIs.

Treatment of Data

The statistical tool used in the study isdescriptive statistics, where frequency tablesindicating frequency counts, percent, weighted means, and ranking are indicated.

Table 2. Descriptive Interpretation of the Extent of Utilization and Involvement of the Business Graduates in the University Business Incubator

Scale	WeightedMean	Descriptive Rating	Qualitative Description
4	3.50 – 4.00	Very often	Utilized to alarge extent
3	2.50 – 3.49	Often	Utilized
2	1.50 – 2.49	Seldom	Utilized to a ModerateExtent
1	1.00 – 1.49	Not at all	Not utilized

In qualitative analysis, codes were generated to aid in the analytical process for the qualitative data. To ensure that no information was missed out during analysis, classical, invivo and free coding was used. The themes from the qualitative narratives were, in return, supported by quantitative findings and observation data. The interpretations from these analyses were thebasis for developing the institutional model.

Result and Discussion

Section 1. Present Situation of University Business Incubators (UBIs) in Selected Higher Education Institutions (HEIs)

1.1 Years of Operation

The table below shows the number of years thebusiness incubators have been in existence.

Table 3. Years of Operation

BI	Years of Operation
NVSU-Sabatan	2
ISU-CVCDC	10
CSU-BIZNEST	2

The e-documentary review through the UBIs' websites indicates that ISU-CVCDC has established numerous connections. It is the longest-running business incubator among all the UBIs included in this study. In terms of outputs, about 1,567 cacao growers have been reached out through ISU-CVCDC since 2015, with a number already involved in cacao processing. Additionally, the Intellectual Property Office (IPO) of Taguig City granted the Certificate of Registration and Utility Model to most of the cacao products in the center. These

accomplishments made ISU a recognized processing hub in Cagayan Valley.

In close comparison, it cannot be denied that NVSU-Sabatan and CSU-BIZNEST, while younger by eight years than ISU-CVCDC, both register a remarkable number of connections and accomplishments. Both BIs produced successful businesses, start-ups, and technopreneurs.

Given the above data, it can be surmised that establishing connections and realizing accomplishments among BIs are not based on years of operation. The success of a business incubator may come from its successful start- ups and businesses that were assisted in the incubation center, the presence of facilities and a skilled workforce, and the like.

1.2 Number of Staff

The survey shows that the CSU-BIZNEST employs five full-time staff compared to three staff of ISU-CVCDC and two staff for NVSU- Sabatan Techno Hub, respectively.

Table 4. Number of Staff

BI	Full-time	Part-time
NVSU-Sabatan	2	5
ISU-CVCDC	3	5
CSU-BIZNEST	5	0

On the other hand, five part-time employees are engaged in NVSU-Sabatan and ISU-CVCDC, whereas CSU-BIZNEST does not have any. This reflects that NVSU-Sabatan and ISU-CVCDC have more business incubator workforce when compared with CSU- BIZNEST. It was also observed that both ISU- CVCDC and NVSU-Sabatan's part-time staff are all employed in the said universities as faculty members, and some are even holding high administrative positions.

The researcher deduced that meeting the required number of staff for every UBI could be an essential factor in enhancing the realization of accomplishments of UBIs. Staff are crucial to the UBI, not only the required correct number but also qualified, skilled, trained, and tenured personnel. One probable reason CSU-BIZNEST has bragging rights of supporting more technopreneurs, start-ups, and businesses is because all its staff is full-time, so they can focus more on assisting their clients. Compared to the other two UBIs, their part-time staff may be more focused on their full–time jobs at the University, so focusing and following through with the clients will be more difficult.

1.3 Products Developed

Based on the survey conducted, no cited products are developed for the following industries: education, technology, transportation, health, renewable energy, water, and space.

However, NVSU-Sabatan, have products developed which are under the following categories: Metal Technology (fruit harvester pruner, customized biogas digester, manually- operated two-row multi-purpose hand seeder, mushroom substrate bagger, recirculating blade biomass shredder, mango fruit bagger, piglet feeding crate, essential oil extractor, hold-on type padding thresher, trailed type anaerobic biodigester, day and night insect trapper, transportable livestock feed mixer, diesel-powered hammermill, mechanical mushroom fruit bagger, mushroom mist maker); Food Technology (Asian spoon fish cream soup); Software Technology (Lucky POS); Bio-Technology (Bio-insecticide, automated irrigation and nutrient management system); and Technology and Health (Herbal soap).

For ISU-CVCDC, the following products were developed under the following industry classifications: Technology and Health (dark chocolates, tablea, bread fortified with cacao pod husk powder, cacao vinegar, wine, juice made of the cacao fruit, tablea tops); FoodDevelopment and Technology (tablea tops, tablea-based dak chocolate bars, tablea kisses, 90% dark chocolate, 80% dark chocolate with yema filling, caramelized nibs, 80% dark choco

raisins filling, pastillas de cacao, natural vinegar, polvoron de cacao); and Non-Food (Organic fertilizer).

And for CSU-BIZNEST, the followingproducts were developed under Food Processing category (cacaolets, cacao tableya, cacao liquor, fun-cee, itag, neem oil, coffee blends, crispy mushroom, veggie bagoong, lemongrass tea, burong isda, gourmet fish products, and chocolate products)

It was indeed a significant milestone for UBIs to support and aid start-ups or spinoff companies or enterprises and new entrepreneurs or technopreneurs to fulfill their business objectives faster and better with the development of these products. As mentioned in the objectives of the UBIs, one of theirpriorities is to develop students' skills toward becoming entrepreneurs. However, there are only a few outputs produced by students. Mostare developed by faculty members, researchers, and external businesses. Besides, the UBIs are owned by universities, where students should be the first and foremost clientele. This is substantiated by Palina(2013) when he said that students have limitedengagement with UBIs even when they arestudying at the University that owns the UBI.

1.4 Facilities

The Department of Science and Technology (DOST) defines *Technology Business Incubator* (TBI) as a facility where start-ups are hosted, and business development services are provided (DOST, 2014). TBIs offer financial viability and sustainability among their operators. On the other hand, some of its main tasks are to provide office facilities. One of the requirements for running an incubation center is having the facilities readily available to cater to the needs of the incubation (Ignacio et al., 2019).

In this study, the availability of simulator space is a feature shared by all of the UBIs. In contrast, office space and a development center are accessible in the two business incubators. Only NVSU-Sabatan has a prototyping facility, pantry, co-working space, fabrication lab, and makers' space.

The ISU-CVCDC, on the other hand, featuresa conference room and a processing center, which are not available in the other UBIs. The processing center of the ISU-CVCDC housed its simulator space, development or processing area, and conference room. The conference room also functioned as their receiving area. The processing area is wherethey developed and processed their products. The UBI offers access to fully- facilities where its incubatees andstakeholders may efficiently conductbusiness transactions.

The incubation center's facilities werelimited to office space and simulator space for CSU-BIZNEST. Their simulator space is located in the office space. It is where the meetings, conferences, and other activities are held. The available facilities that a business incubator offers make the incubator more than just shared office space. It is deemed necessary that this service is designed to fit the specific needsof current clients.

1.5 Number of Utility Models/Patents

Patents and utility models are powerful "business tools" that allow inventors/innovators to attain exclusivity over new products, services, & processes, resulting in more vital market positions and more substantial revenues (DOST, 2007).

Interestingly, CSU-BIZNEST and NVSU- SABATAN, both in their two years of operation, marked an accomplishment when it comes to developing utility models and acquiring patents.

Table 5. Utility Models Developed and PatentsAcquired Through the Business Incubators

Business Incubator	No. of utilitymodels developed	No. of patents acquired
NVSU-Sabatan	11	1
ISU-CVCDC	8	0
CSU-BIZNEST	16	5
TOTAL	**35**	**6**

1.6. Other services offered by BI

Results of the study revealed that all of the UBIs in the three universities under study have mentorship, business plans for development support services, profit management training and coaching, strategic management and coaching, and business continuity coaching.

On the other hand, ISU-CVCDC does not have training in innovative problem-solving techniques, financial management training and coaching, training and coaching with regards to legal issues, marketing management, training and coaching, and HR management trainingand coaching, while the NVSU-Sabatan and CSU-BIZNEST have. In terms of the services offered by the UBIs, it was discovered that not all of the services provided by the three UBIs under consideration are available to theirstudents. According to the BI personnel in two universities from NVSU and CSU (ParticipantsNo. 1 and 8), their services are offered primarily for incubatees such as start-ups and businesses. For their students, mentorship through seminars, training, and workshops wasprovided as part of their subject matter or as part of the activities in the college, such as conducting workshops during the business week. These findings were validated by follow-up interviews conducted with the college deans, department heads, and faculty advisers of the three HEIs.

Since there is a discrepancy in the intention of BIs in their objectives of catering to the development of students to the actual practice of providing priority services to external businesses and start-ups, a clear-cut policy should be in place. This ensures equal opportunities for assistance to all intended clients, including students.

1.7. Linkages

Concerning the number of local and international linkages established between the business incubators in HEIs, 21 local agencies linked with NVSU Sabatan, 10 for ISU- CVCDC, and eight (8) for CSU-BIZNEST. Onthe other hand, only ISU-CVCDC established four (4) international linkages resulting in 14 local and global partnerships. There are 43 linkages in total for the three UBIs.

The Department of Science and Technology (DOST) and the Department of Trade and Industry (DTI) are the common connectionsthat assist all three BIs. For instance, DTI provides mentorship, technical support, access to facilities, partners for events and programs, and fund support. In contrast, DOST provides fund support, serves as a technical validator, and provides mentorship to the BIs under study. Other PHEVs such as SMU and PLTCI serve as potential sources of incubatees andmentors for NVSU-Sabatan. While ISU- CVCDC, with the help of its international linkages, earned global applause in the 2021 International Chocolate Awards Americas inNew York, bagging multiple sweet awards and the Kasama Company, a multi-awarded chocolate company based in Canada. Other linkages such as LGUs, cooperative banks, andother agencies provide access to facilities and partners for events, programs, and promotion.

These mentioned linkages are also advantageous to the business students because these UBIs serve as venues for practicum or on-the-job training (OJT) and as prospective employers when they graduate. Linkages may also be funding sources when graduates decide to put up their businesses. They can also be benchmarks for the students for best practices in managing their business ventures.

As a result, the importance of a relationship between the institution and its external environment in supporting a new business at the earliest and most vulnerable stage of its lifecycle cannot be overstated.

1.8. Number of Technopreneurs, Businesses Assisted, and Start-ups

When asked about the number of technopreneurs, business assisted. Start-upsthrough the business incubators, results of follow-up interviews conducted among the UBI personnel of the three UBIs noted that CSU-BIZNEST, with two years of operation, has the most businesses assisted (115), technopreneurs (14) and start-ups (14).

For NVSU-Sabatan, 13 technopreneurs, 13 start-ups, and five businesses were assisted within its two years of operation. ISU- CVCDC, on the other hand, with ten years of operation, has zero for both technopreneur, start-ups and

business assisted because it is not stated in the CVCDC mandate to help businesses. Therefore, it can be inferred that some of these business schools have not contributed much to promoting and developingbusiness enterprises or university spinoffs. As budding entrepreneurs seek a fair chance tomarket their idea or concept, UBIs are designed to resolve any ideas' deficiencies and support their business concept. University business incubators' duties should, thus, be expanded beyond basic infrastructures and include entrepreneurial skills like marketing and technical skills and social networking skills in the establishment of successful entrepreneurs and technopreneurs.

1.9. Best Practices and Challenges

The National Business Incubation Association (NBIA) (2010) believes that the success of a business incubator lies in good practices.Results showed that all UBIs personnel- participants considered providing linkages the number one best practice of the three business incubators based on the survey conducted. This was corroborated by the UBIs, who createdseveral local and international links. As narrated by the BI personnel from NVSU- Sabatan (Participant No.1), linkages are advantageous to students because they would help them get employed. It was also observed that for the three UBIs understudy, through their strong ties to their local partners, the BIs can quickly get access to technical support services, access to facilities, and fund support from their partners. This is why all the three BIs considered linkages as their top best practice. ISU-CVCDC, on the other hand, having international partners, gained support in promoting their chocolate products to international countries like Canada.

Mentorship is one of the highest-ranking best practices for BIs because it is the main service universities provide well. All the resources such as mentoring materials, trainers and mentors, facilities and technologies, and training standards are already available at the University; hence, the service provision of the BI should be effortless. Nevertheless, since this service is the most readily available that theBIs provide, it is the only service that students receive in abundance from the center. However, considering the priority they cater to,the mentoring that students receive is still not adequate as expected.

Moreover, the provision on capitalization obtained the lowest rank but is still considered by the UBIs to be their best practice. This is because capitalization is one of the most sought-after elements in business. The UBIs' practice of assisting entrepreneurs is a popular and welcome one. New entrepreneurs are looking for start-up capital, and when UBIshelp them locate it, it is a best practice forthem. For example, NVSU-Sabatan ensures that the business ideas of its incubatees arepresented to financial intermediaries such as the Land Bank of the Philippines (LBP), who may be able to support the project. In addition to this, through the UBIs local partners and linkages that provide financial support to the UBIs, the UBIs understudy opens an opportunity for their incubatees such as conducting business pitching activities and booth camps, wherein winners in these activities will be given financial aid or capital to support their businesses.

This study also explored the issues and challenges faced by the UBIs in the three universities understudy as they attempt to upkeep and support their clients. The study revealed that besides the desire to be self- sufficient, business incubators faced other challenges as follows: the issues withprocedures and guidelines; physical facilities constraints; financial constraints; sustainability issues; limited opportunities for internships; and lack of skilled/trained staff, which were found to be the major challenges faced by business incubators.

Section 2. Business Graduates' Involvement in the University's Business Incubators (BIs)

This section presents the level of involvementof the business graduates in terms of the degreeof utilization in the services offered by the business incubator, level of participation in terms of idea generation, outputs generated, and their involvement in the drafting of guidelines in the business incubator as perceived by themselves and the BI personnel.

2.1. Access to an incubation center

This section determined how many businessgraduates from the three universities haveaccess to the incubation center.

Table 6. Frequency Distribution and Percent of Business Graduates with an Emphasis on the Participants with and without UBI Exposure to School Graduated

School graduated from	NVSU		ISU		CSU		Total	
	Freq	Percent	Freq	Percent	Freq	Percent		
With exposure	14	70	20	95.24	0	0	34	72.34
Without exposure	6	30	1	4.76	6	100	13	27.66
Total	**20**	**42.6**	**21**	**44.7**	**6**	**12.7**	**47**	**100**

Table 6 shows the spread of business graduate-participants in the University where they finished their BSBA degree. 21 or 44.7% came from ISU, Echague campus, and 20 (42.6%) came from NVSU, Bayombong campus. The remaining six or 12.7% of the participants came from CSU, Andrews campus.

Table 7. Frequency Distribution and Percent ofBusiness Graduates with an Emphasis on the Participants with and without UBI Exposure as to Year Graduated

Year	2018 – 2019		2019 – 2020		2020 – 2021		Total	
Graduated	Freq	Percent	Freq	Percent	Freq	Percent		
With exposure	3	21.43	13	92.86	18	94.74	34	72.34
Without exposure	11	78.57	1	7.14	1	5.26	13	27.66
Total	**14**	**100**	**14**	**100**	**19**	**100**	**47**	**100**

In addition, table 7 shows the distribution of business graduate-participants with and without UBI exposure in terms of the year they graduated. Generally, the total number of graduates exposed to businessincubators is 34 or 72.34%, and 13 or 27.66% were not exposed to business incubation centers.

Under CMO 17 of 2005, known as theMinimum Curricular Requirements for BS Entrep, an incubator that has to be set up in the school to support the entrepreneurship programmust provide students with hands-on experiences of actual business situations in terms of its physical setup. This statement is not present under the CMO 17 series of 2017 or the Revised Policies, Standards, and Guidelines for BSBA. This is why UBIs rarely engage their students, particularly the BSBA students.

This finding implies that the use of business incubators as the venue for on-the-job training for business students was not integrated into the curriculum of the BSBA program. This may be why there's a limited opportunity for BSBA students or graduates in the university incubation center.

Table 8. Frequency Distribution and Percent of theBusiness Graduates' Participants with Exposure in the University Business Incubators as to Employment Status, Occupation, and Position in the Company

Employment Status	No. of Participants with exposure to the UBIs	Percent
Employed	18	52.94
Unemployed	12	35.29
Self-employed	4	11.76
Total	***34***	***100.0***
Occupation		

Employment Status	No. of Participants with exposure to the UBIs	Percent
Private emp	16	47.06
Government emp	6	17.65
Unemployed	12	35.29
Total	***34***	***100.0***
	Position	
Business Owner	3	8.82
Admin/Office Staff	2	5.88
Sales Associate	2	5.88
Bank employee	3	8.82
Marketing Staff	5	14.71
Service Crew	2	5.88
Part-time tutor	1	2.94
Encoder	1	2.94
Call Center Agent	1	2.94
Field Officer	2	5.88
Unemployed	12	35.29
Total	***34***	***100.0***

Moreover, out of 47 business graduate- participants, based on the table above. 2018- 2021, 34 graduates were identified to have exposure or involvement in the university business incubators. The table reveals that 22 or 64.71% of the graduates with exposure BIs are employed in a private agency, with 16 or 47.06%. In comparison, 6 or 17.65% are used in the government agency. However, 12 or 35.29% are still looking for a job.

Results of this study can be attributed that the majority of the opportunities for employability awaiting the business graduates with exposure in the BIs are in the private sector. Regarding technopreneurship capacity, three, or 8.82%,owned and managed small businesses, while others are in the entry to mid-level positions related to the participants' line of specialization. This shows the preparation of the business graduates to compete with other graduates from other institutions, demonstrating the quality, capability, and competitiveness of the graduates due to the education and training acquired by the participants from the universities and BIs. The

12 unemployed graduates, or 35.29% of the total participants, include those who purposely did not pursue employment for one reason or another. These reasons include full-time continuing education, preparing for a business start-up, ongoing personal projects, or waiting out the pandemic before applying for the job of choice.

2.2. Extent of Utilization of theIncubation Center

This section shows the extent of usage of the business graduates in various ways, namely,physical resources and office support services, and business training and support services.

The table presents the business graduates' and BI personnel's perceptions and observations onthe graduates' extent of utilization in terms of physical resources and office support and business training support services offered inthe business incubator based on the survey conducted, which were answered by 47 business graduates and 10 BI personnel.

Based on the results, both views showed a different utilization level among the given list of physical resources and supportservices by the BIs. This result can be attributed to the high level of utilization by the business graduates is based on what thegraduates have gained and learned in the business incubator, regardless of how shortor long their exposure in the BI is. This is apparent because their seniors (those who graduated before 2018 from NVSU and CSU) never had any exposure to business incubators, maybe because there were still no BIs or no internship programs in BIs.

Table 9. The extent of Utilization of the Business Graduates in the Incubation Center as to Physical Resources and Office Support Services, and Business Training Support Services as Perceived by the BI Personnel and the Business Graduates

Physical Resources & Office Support Services	BI Personnel Perception			Business Graduates' Perception		
	Mean	Rank	Extent of Utilization	Mean	Rank	Extent of Utilization
1. Office space	2.20	2	Low	3.43	1	High
2. Prototyping Center	1.90	3	Low	2.94	3	High
3.Simulator	1.70	4	Low	2.89	4	High
4.Development Center	2.40	1	Low	3.15	2	High
Overall Physical Resources & Office Support	**2.05**		**Low**	**3.101**		**High**
Business Training & Support Services						
1. Mentorship	2.70	1	High	3.64	1	Very high
2. Business Plan development support services	2.50	2	High	3.57	2	Very high
3. Training in Innovative problem- solving-tecniques	2.10	6	Low	3.28	4	High
4. Project management training and Coaching	2.30	5	Low	3.23	6	High
5. Financial management training and Coaching	2.40	3	Low	3.28	4	High
6. Training and coaching with regards to legal issues	2.00	7	Low	2.98	10	High
7. Marketing management training and Coaching	2.40	3	Low	3.38	3	High
8. HR management training and Coaching (staffing)	1.90	8	Low	3.15	7	High
9. Strategic Management training andCoaching	1.90	8	Low	3.15	7	High
10. Business continuity coaching	2.20	10	Low	3.13	9	High
Overall Support Services	**2.24**		**Low**	**3.279**		**High**
Overall Services	**2.15**		**Low**	**3.190**		**High**

Scale: 1.00 – 1.49 - Very Low; 1.50 – 2.49 – Low; 2.50 – 3.49 – High; and 3.50 – 4.00 - Very High
Note: Participants with (n/a) responses were no longer included in the analysis

As graduate-participant ten said, "It was not established during our time,"; and graduate participant 11 said, "There was nobusiness incubator (TBI) during mycollege years."; graduate-participants 13 and 14, "It does not exist in the year 2018" and "No TBI in 2018", respectively; graduate-participant 32, "I have no experience nor involvement in the CSU BIZNEST," and graduate-participant 36, "No exposure in the incubation center." The fact that the graduates were able to have opportunities to train in BIs, however brief these are, is a big deal for them compared to those who had no experience or exposure to BIs.

Their point of comparison is the opportunities they have now, which were non-existent before2018. That is why any utilization or involvement is perceived as high for them. This

is evident in their narrations. Graduate- participant 24 from ISU said, "They train students how the process of raw cacao turns to chocolate. How to properly advertise and sellto the market."; and graduate-participant 41, also from ISU, "Academic incubators are important in any business's first stage of life. These institutions can help enhance the quality of management and strengthen managers' leadership."

While the low level of utilization of the business graduates as perceived by the BI personnel is based on the high expectations of the BI personnel. Note that the BI personnelare not assessing their experiences. Instead, they are evaluating the students. It is not adirect experience, and they can only compare their own experiences with that of the students.The point of comparison is from their utilization of the facilities and services, which would be much more than the students' utilization as they are working in the BIs.

The table also shows the business graduates and BI personnel's perceptions and observations on the graduates' extent of utilization in terms of business training andsupport services offered by the business incubator. The table illustrates that among the ten-business training and support services offered by the business incubators, both participants ranked mentorship and business plan development support services as the most utilized services by the business graduates, which both ranked 1 and 2 (mean 2.70 & 3.64;

2.50 & 3.57) described by the BI personnel as the great extent of utilization by the graduates, while described as graduates as very great extent of utilization by the graduates themselves.

According to the BI personnel and the BSBA program chairs interviewed, the University BIs accommodate most of the start-ups and university practitioners with readily available products and technologies. However, BIs also cater to BSBA students by providing mentorship and coaching relevant to their subject matter, such as developing business plans and marketing plans; providing seminars and workshops related to marketing and business planning; using the BI computer equipment for developing advertisements which are a requirement for their subject; usingthe BI conference room and other facilities as a venue for classroom activities; BI as one of the sites in conducting the students' on-the-job pieces of training; BIs were also used for student-activities like business week celebrations; and the like.

As in the previous section, the perception of the BI personnel on the utilization of the students is at a low level, while the students consider themselves highly utilizing the business training services of the BIs. Again, this is purely experiential because the students directly experience training, mentoring, and coaching. The BI personnel's perception is secondary. Nevertheless, the BI personnel's narrative includes: BI personnel 3 said, "Through the coaching, training, and seminars offered by Sabatan, the skills, and knowledge of the business graduates are more enhanced, especially on entrepreneurship. Another is the linkages provided by the organization for easier connections with other non-government and government agencies."; BI personnel from NVSU-Sabatan (Participant No.5) stated, "The center provides pieces of training, seminars, and workshops for added skills development for business students."; and BI personnel also from NVSU Sabatan (Participant No.7) said, "Applied what the students learned from their training, workshops, and seminars attended. It develops their marketing and technical skills, which drive them to be future young entrepreneurs." From the narratives of the BI personnel, there is no indication that the service is inadequate and that the students availed of these as expected. Yet, they rated the students' utilization as low. This means thatalthough the program is ideally set to provide students services, they do not get what the BI personnel expect them to receive.

An example is CSU-BIZNEST, which provides mentoring services to BSBA students. Still, it is only meant for BS Entrepreneurship students. This is because BS Entrepreneurship's CMO requires them to go through internships or training in BIs. The narratives of the graduates reflect the high rating that they have given. However, the BI personnel's narratives

are inconsistent with their low utilization ratings.

Therefore, it is to be emphasized that mentoring and training in business incubators are part of the process. Some mentors are funded or paid by the University, and there are also volunteers. Still, the objective is to assist and educate the upcoming entrepreneur and technopreneur in business development(Suleiman, 2020).

2.3 Idea Generation

Table 10 presents the business graduates and BI personnel's perceptions and observations onthe graduates' extent of involvement in termsof idea generation.

Table 10. Level of Involvement of the Business Graduates in the Incubation Center as to Idea Generation as Perceived by the BI Personnel and the Business Graduates

Idea generation	**BI Personnel Perception**			**Business Graduates' Perception**		
	Mean	**Rank**	**Level of Involvement**	**Mean**	**Rank**	**Level of Involvement**
1. Prototype development	1.40	3	Very Low	2.81	4	High
2. System development	1.30	4	Very Low	2.83	3	High
3. Product development	2.50	1	High	3.28	1	High
4. Testing/ Validation	2.30	2	Low	2.98	2	High
Overall Idea Generation	**1.88**		**Low**	**2.97**		**High**

Scale: 1.00 – 1.49 - Very Low; 1.50 – 2.49 – Low; 2.50 – 3.49 – High; and 3.50 – 4.00 - Very High
Note: Participants with (n/a) responses were no longer included in the analysis

As in the last two sections, the perceptions of the involvement of the students in the ideation of the two groups differ, the high extent of involvement for the business students and low for the BI personnel. Based on the table above, both participants ranked product development as having the highest level of graduates' involvement in idea generation with a means of

2.50 by the BI personnel and 3.80 by the business graduates. On the other hand, system development ranked 4^{th} by the BI personnel with a mean of 1.30, described as low involvement. In contrast, prototype development was considered last on the list by the business graduates, with 2.81. However, it was still described as a high level of involvement.

This can be attributed to the fact that the primary activity of students in the business incubator is to develop products that create innovative ideas. As graduate-participant 44 said, "Thinking more other ways and finding more things to develop and innovate products. " Looking at the means and ranking, both groupsranked idea generation in "system development" and "prototype development" as 3^{rd} and 4^{th}. The idea generation in these two areas is specialized and may need longer to learn in the short time that the students were immersed in the incubator centers. This holds in the study of Foo & Turner (2019) and Saptono et al. (2020) that business graduates could receive more value-added benefits and real-life experiences from being an incubator. Given this incite, what is transpired in the HEIswith business incubation facilities is that there is still limited opportunity for business students or graduates to use BIs as a venue forgenerating ideas.

2.4 Output Generated

The table below present the business graduates and BI personel's perceptions and ations on the graduates' level of involment in the business incubator's outputs.

Table 11. *Level of involvement of the Business Graduates in the Incubation Center as to Outputs Generated in the Business Incubator as Perceived by the BI Personnel and the Business Graduates*

Outputs generated	BI Personnel Perception			Business Graduates' Perception		
	Mean	Rank	Level of Involvement	Mean	Rank	Level of Involvement
Prototype development	1.50	3	Low	2.87	4	High
System development	1.30	4	Very Low	2.91	3	High
Product development	2.30	1	Low	3.28	1	High
Testing/Validation	2.20	2	Low	2.98	2	High
Patents	1.30	4	Very Low	2.74	6	High
Utility Models	1.30	4	Very Low	2.77	5	High
Overall Outputs Generated	**1.65**		**Low**	**2.926**		**High**

Scale: 1.00 – 1.49 - Very Low; 1.50 – 2.49 – Low; 2.50 – 3.49 – High; and 3.50 – 4.00 - Very High
Note: Participants with (n/a) responses were no longer included in the analysis

In terms of the outputs generated by the business graduates in the University BIs, it can be drawn that both groups of participants ranked product development as the highest level of involvement by the graduates (m= 2.30) by the BI personnel (m=3.28) and by the business graduates. However, business personnel ranked 4th for system development, patents, and utility models (m=1.30, very low level of involvement). In contrast, thegraduates considered acquiring patents the last item (m=2.74).

Looking at the means, both the business graduates and BI personnel similarly gauged the ranking, especially for product development and testing/validation. From student participant 19 narrative, "They teach us how to make or produce a new product, and how to be a businessman/businesswoman." For the BI personnel, the engagement on outputs generated is fundamental. BI personnel 6 stated, "They may use the basic skills they have gained during their OJT and apply themto the outside world for their future endeavors." In the narratives, there are indications that the business students who wereon OJT with them learned the basics.

2.5. Crafting of Guidelines

The table presents the business graduates and BI personnel's perceptions and observations onthe graduates' level of involvement in crafting guidelines in the business incubator.

Table 12. Level of Involvement of the Business Graduates in the Incubation Center as to Crafting of Guidelines in the Business Incubator as Perceived by the BI Personnel and the Business Graduates Themselves

Crafting ofguidelines	BI Personnel Perception			Business Graduates' Perception		
	Mean	Rank	Level of Involvement	Mean	Rank	Level of Involvement
Idea/Concept Assessment	1.50	3	Low	3.23	1	High
Prior Art/Patent Search	1.40	5	Very Low	2.79	5	High
Patent Prosecution	1.30	7	Very Low	2.72	7	High
Incubation	1.40	5	Very Low	2.79	5	High
Business Acceleration	1.50	3	Low	2.83	4	High
Mentorship/Training Program	1.80	1	Low	3.17	2	High
Commercialization	1.60	2	Low	3.00	3	High
Overall Crafting of Guidelines	**1.50**		**Low**	**2.933**		**High**

Scale: 1.00 – 1.49 - Very Low; 1.50 – 2.49 – Low; 2.50 – 3.49 – High; and 3.50 – 4.00 - Very High
Note: Participants with (n/a) responses were no longer included in the analysis

From the table above, based on the BI personnel's perception of the level ofinvolvement of the business graduates incrafting guidelines, "mentorship/training program" is ranked number 1 (mean 1.80). In contrast, "idea/concept assessment" is ranked number 1 by the business graduates (mean 3.23). Meanwhile, both participants ranked "patent prosecution" as no. 7, described as verylow for the BI personnel but a high level of involvement by the graduates themselves.

As specified, the BI personnel's perception of the business graduates' contrasts with the graduates' perception of their involvement in crafting guidelines. The attribution for this contrast is that the business graduates assess their own experiences. In their view, the chance of being included in an essentialfunction of the BIs is a big deal for them, and they consider it a privilege. They compare their experience to their seniors who have not been involved in BIs. While among the BI personnel, they assess a second-hand experience and an observation, comparing it with their involvement with their work. Nevertheless, there is no inadequacy in the services they give to their OJT's in their narratives. BI personnel from NVSU-Sabatan (Participant No.1) said, "*May student interns po this year lang, pero not specifically BSBA- MM, kundi BSBA-FM pero yung pinapagawa lang po namin ay tutulong lang sila sapreparation ng venue, snacks, documentations,kung may mga events ang Sabatan*" (There are student interns this year, but not specifically BSBA-MM, but BSBA-FM, however, the tasks we gave them were only to help with the preparation of venue, snacks, documentation, and whenever Sabatan has events). This shows that they are still not confident in involving their interns or OJTs with many responsibilities. Thus, the low-level utilization of the different services of the BIs because they assign them menial jobs. However, being an intern is already an involvement in the BI process for the students.

These findings can be linked to the notion that the discrepancy in perceptions between BI personnel and business graduates can be related to the University's unclear policies and guidelines.

Section 3. Significant Contribution of the Business Incubators in the Business Graduates' Employability and Technopreneurship

Figure 1 shows the significant contributions of specific BIs and the frequency that participantshave identified. The themes identified were extracted from the responses of both business graduates and the BI personnel evaluating the business students.

The figure belowshows the themes, which are the identified practices of the business incubators. These practices are also the contributions of the BIs to the business graduates'employability and technoprepreneurship because the required skills are obtained from their involvement with the BIs, as derived from the participants' responses. The identified practices are ideation,mentoring, coaching, training, workshop;marketing skills development; leadership and management skills development; and competitiveness.

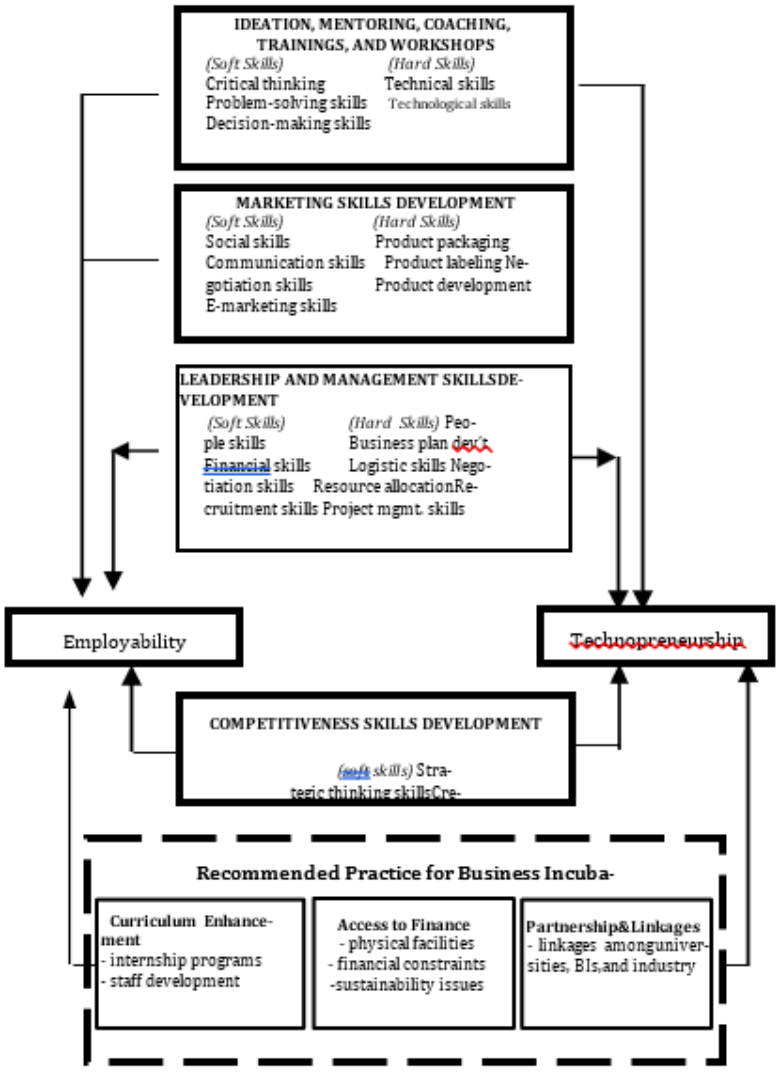

Figure 1. Business Incubators' Significant Contribution to theBusiness Graduates' Employability and Technopreneurship

Conclusion

One of HEIs' reasons for existence is to prepare their graduates for a lucrative future. For some people, a productive lot means securing their dream job. For some, it is being able to put up their own lucrative business.The changing times brought by the 4IR have also resulted in a shift in the educational mindset. One of these new ways is theimmersion of students in business incubators, where they are trained, mentored, and giventhe experience of converting business ideas into legitimate money-making enterprises.

The current research sheds light onentrepreneurial learning by offering a more generic role of university business incubators in preparing business graduates for employability and technopreneurship. This included business incubators as a variable that acted as a mediator between entrepreneurialeducation and entrepreneurial initiatives. Business incubators are not only hubs for start-ups but also a training ground to mold students into successful business practitioners.

Based on the findings of the study, thefollowing conclusions were drawn:

1. The present situation of the university-based business incubators is good. Results showed that one of the BIs existed for ten years, and the other two were established

two years ago. The average staff for the three UBIs is four full-time and part-time personnel. The UBIs have 13 facilities, developed 25 total utility models, and acquired six patents. They manufactured products in eight industry classifications. The three UBIs share a total of 38 linkages among them. The BIs supported 14 technopreneurs, 14 start-ups, and 115 businesses assisted.

(1) The best practices of the UBIs in universities were also highlighted: (1) provision of linkages, (2) incubation facilities, (3) mentorship, (4) market mission, (5) opportunities for internships, and (6) capitalization. It also explored the challenges faced by the BIs as they attempt to upkeep and support their clients. Based on the data collected and analyzed, the major problems common to the UBIs are issues with procedures and guidelines,

(2) physical facilities constraints, (3) sustainability issues, (4) limited opportunities for internships, and (5) lack of skilled and trained staff. Additional challenges for ISU-CVCDC were also identified wherein there is no/lack of LGU support to the cacao industry in Region 2 and issues on logistics.

2. The current paper also presented the involvement of the business graduates in the university UBIs. It was revealed that, despite the presence of university policies where business incubators in universities are operated to develop students' interest in entrepreneurship, it was found that there's a reversing response between the business graduates and BI personnel in which there was a consistently high extent of involvement in UBI training support services, idea generation, outputs generated and crafting of guidelines as perceived by the graduates themselves. However, the BI personnel perceived a low extent of involvement of the business graduates for all the UBI services and facilities, meaning there is still a limited involvement of students in UBIs.
3. The results of this paper demonstrate that university BIs can make some contributions to the development of the business graduates' employability and technopreneurship: (1) development of marketing skills and capabilities, (2) development of technopreneurship skills, (3) development of employability skills, (4) development of competitiveness skills, (5) development of leadership skills and all these skills are through the BIs provisions of (6) ideation, mentorship, coaching, training, and workshops.

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