

## Quality assurance and school outcomes: A Philippine state university experience

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**ABSTRACT:** This study aimed to ascertain the function of quality assurance in facilitating desired school outcomes with the University of Science and Technology of Southern Philippines as the unit of analysis. Using the outcomes-based approach to assessment, the data were gathered from 230 graduates and 12 administrators through survey questionnaires. Secondary data were also used such as the institution's annual accomplishment reports, quality assurance reports, and audit reports, among others. The findings revealed that the university has greatly contributed to the socioeconomic and innovative development of the region. This is in terms of program outcomes as evidenced by its research and technology products, graduates serving in the government and industry, and the centers created that cater to the needs of the industry and community. Its quality assurance arrangements are considered as the facilitating factors of bringing out the program outcomes. From the hard evidence, significant factors include management, enabling features, quality instruction, particularly the design-thinking process, professional exposure, research and creative works. However, based on the assessment of the respondents, the university has to strengthen the implementation of its quality assurance arrangements to ensure its effectiveness. This is with regard to the upgrading of laboratories and more professional exposure for faculty and students. This study concludes that when quality assurance arrangements are in sync with the institution's vision, mission, and goals, it becomes a significant enabler of attaining desired school outcomes.

**KEY WORDS.** Quality Assurance, School Outcomes, Innovations

### I. Introduction

The role of higher education institutions in contributing to socio-economic development has received greater attention in recent years. This thrust recognizes the importance of higher education in development through research and innovation in the provision of high-quality training for professionals from various fields such as engineering, technology, education, science, and mathematics (Kearney, 2009; Kruss, et.al., 2015). These are the kinds of school outcomes that higher education institutions in the Philippines are mostly aspiring for. In the study of Adeyemo and Weber (2018), the authors asked "Can quality assurance policies in higher education promote socioeconomic development?" The results revealed that in the Philippine context, it is dependent on the extent of implementation of quality policies.

According to Arbo and Benneworth (2007), "the economic success" and competitiveness of nations would be dependent on their capacity to perform innovations. The "National Innovation System" (NIS) supports this claim by providing a framework for enhancing the socio-economic contribution of universities in developing countries. It considered knowledge as the most important resource and learning as the most important process (Lundvall, 1992; Hislop, 2003). The simple reason for the applicability of the NIS in every context is that it works through the introduction of knowledge into the economy and society at large (Lundvall, et.al., 2002).

Among other things that the NIS concept offers to strengthen the role of higher education in socio-economic development is the interactive model (as opposed to the traditional linear model), which provides grounds for feedback from society and, therefore, the possibility of higher education institutions to be aware of their evolving market niches. The NIS concept provides opportunities for universities to commercialize their activities (Shapira, et.al., 2011) and thereby strengthen their financial basis. It promotes universities as major players in national production and innovation as well as provides a new vision and career path to academics between academia and industries (Doh, 2011; Motohashi, 2005). Recently, scholars have considered the Science, Technology and Innovation perspective as a narrow form of innovation. Innovations do not pertain only to the new world innovation but also "to the absorption of technology and competence as well (Mowery, 2005; Chaminade, 2009).

This study is anchored on the National Innovation System (NIS), which is a concept considered to reinforce the role of the university in socio-economic development (Saad and Zawdie, 2011), and as a facilitator capable of providing new avenues of resources for universities. These may include the possibility to commercialize their activities, thereby strengthening their financial bases, new career opportunities as well and feedback on their services, especially given the interactive model of innovation (Doh, 2011).

This study aimed to ascertain how quality assurance could bring about school outcomes particularly the socioeconomic and innovative contributions of the University of Science and Technology of Southern Philippines to the commonwealth. Specifically, it endeavored to answer the following questions: To what extent does the quality assurance of the university contribute to the production of quality graduates along the following core indicators: governance and management, quality of teaching and learning, professional exposure, research and creative work, support for students, and relations with the community? How does the university contribute to the socioeconomic and innovative development of the region? How do the results of the study provide implications for the enhancement of the university's curriculum?

This study assumes that the quality assurance mechanisms of the university contribute to the production of quality graduates (Cheng, 2003; Huber & Gördel, 2006; Taurina, 2015; Shah, Lewis, & Fitzgerald, 2011; Rowe, 2003; Cuttance, 2003) specifically: governance and management, quality teaching and learning, quality of professional exposure, research and creative work, support for students, and relations with the community. It then ascertained the impact of these mechanisms on the institution's socioeconomic and innovative contributions to the region through its graduates, research outputs, innovations, and linkages. Furthermore, the university's contributions serve as an input to the enhancement of its curriculum.

## **II. Methods**

This study employed the outcomes-based approach to assessment because it measured the effectiveness of the quality assurance mechanisms of the university. In addition, the researchers adhered to the idea that mature evaluation systems are based upon outcomes, looking particularly into the intended, implemented, and achieved learning outcomes.

The unit of analysis is the University of Science and Technology of Southern Philippines specifically the Cagayan de Oro City (USTP-CDO) campus. The institution envisions itself to become a nationally recognized S & T University providing the vital link between education and the economy. Its mission is to "bring the world of work (industry) into the actual higher education and training of students; offer entrepreneurs the opportunity to maximize their business potential through a gamut of services from product conceptualization to commercialization, and contribute significantly to the national development goals of food security and energy sufficiency through technology solutions.

Northern Mindanao with 5 provinces, 2 urbanized cities, and 7 component cities is the setting of the study. This locale is selected based on the assumption that most graduates of the university are employed or do business within the region. Many of the institution's research and extension programs and linkages are also considered to be within the area of interest. In addition, this study covers only the USTP Cagayan de Oro City (USTP-CDO) campus.

Purposive sampling was used to identify the participants of the study. Graduate respondents were selected according to the following criteria: they are graduates from the school year 2012-2013 to 2017-2018; they can articulate their socioeconomic and/or innovative contributions to the community where they belong, and they are available and willing to participate in the study. Meanwhile, the deans, directors, and unit heads comprised the administrator respondents. Additionally, there are two groups of participants in this study and these are the 230 graduates of the university and 12 administrator respondents.

Moreover, the data needed in the study were gathered through survey questionnaires. One questionnaire was designed for the graduates, while another questionnaire was designed for the administration. These research instruments were pre-tested to ten respondents not included in the study to determine whether or not the items are clear to them. Three items were revised as a result of the pretest or validation. Secondary data were also used such as the institution's annual accomplishment reports, quality assurance reports, and audit reports, among others.

Furthermore, the quality assurance mechanisms of the university were measured using core indicators such as governance and management, quality of teaching and learning, quality of professional exposure, research and creative work, support for students, and relations with the community. Sub-indicators for governance and management include the enabling features while quality of teaching and learning use program approval and implementation, program monitoring and review, action to strengthen programs, faculty profile, and use of ICT and learning resources.

As to quality of professional exposure, research and creative work, measures such as research capability, creative work, and/or innovation were used. With regard to support for students, recruitment, admission, academic support, student scholarships, and student services were used. Lastly, for relations with the community, the relevance of programs, networking and linkages, and extension programs were used. These measures were adapted from the Institutional Sustainability Assessment of the Commission on Higher Education (CHED).

Furthermore, data collection was made through a self-administered survey with the graduates and administrators. The questionnaires were then retrieved for their convenience. In addition, secondary data were culled from the different units and colleges and information published in the World Wide Web. Meanwhile, quantitative data were processed and analyzed using descriptive statistics, specifically the weighted means.

The research was based on the participants' free and prior informed consent. The research project was fully explained on what it is about, its intentions and aims, and how it will be conducted. It was made clear what taking part in the research would involve, who would have access to the data and how it would be used and stored. The participants, however, were made aware of their right to refuse to participate and the potential uses to which the data may be utilized. The free and prior informed consent form letter signed by the participants was a prerequisite before the interviews were scheduled and conducted.

### III. Results and discussion

1.1. *Extent to which the quality assurance of the university contributes to the production of quality graduates.* Table 1 presents the participants' perception of the extent to which the quality assurance of the university contributes to the production of quality graduates along the following indicators: governance and management, quality of teaching and learning, quality of professional exposure, research and creative work, support for students, and relations with the community. As can be gleaned from the table, both groups of participants rated the quality assurance of the university as to a moderate extent. This means that the quality assurance arrangements of the institution are in place, but not implemented to the fullest extent. Some of the reasons given by the respondents include the need to upgrade laboratories, provide students more professional exposures through field trips and for faculty immersions, and provide more opportunities for faculty development like seminars, trainings, and scholarships, among others.

Nevertheless, in 2016, the University was rated as State Universities and Colleges (SUC) Level IV by the Commission on Higher Education. Universities and colleges rated with this level imply that the institutions are excellent in undertaking the full range of functions of a state university/college; namely, instruction, research, and extension manifested through teaching effectiveness, research competence, active community service, and efficient management of resources. The assessment involved four key result areas (KRAs), the first of which is quality and relevance of instruction. The indicators considered in KRA 1 include the average number of weighted full-time equivalent students per semester in the past three years scholarship, student financial assistance, students involved in inter-country mobility, employability of graduates, faculty profile, accreditation status, and performance in the licensure/board examination.

Table 1. Extent to which the Quality Assurance of the University Contributes to the Production of Quality Graduates along Select Indicators

<b>Key Result Area</b>	<b>Core Indicator</b>	<b>Weighted Mean of Graduates' Rating</b>	<b>Weighted Mean of Administrators' Rating</b>
Governance and Management	<i>Governance</i>	2.26	2.01
	Management	2.14	2.09
	Enabling Features	2.36	2.16
Quality of Teaching and Learning	Program Approval and Implementation	2.34	2.21
	Program Monitoring and Review	2.28	2.11
	Action to Strengthen Programs	2.21	2.05
	Faculty Profile	2.26	2.17
	Use of ICT and Learning Resources	2.29	2.13
Quality of Professional Exposure, Research and	Professional Exposure	2.37	3.02
	Research Capability	2.34	3.00
	Creative Work and/or Innovation	2.29	3.00

Creative Work			
Support for Students	Recruitment, Admission, and Academic Support	2.30	2.14
	Student Scholarships	2.37	2.01
	Student Services	2.13	2.05
Relations with the Community	Relevance of Programs	2.29	2.08
	Networking and Linkages	2.40	2.17
	Extension Programs	2.35	2.20

Moreover, KRA 2 is on research capability and output with the following indicators: research center including percentage of researchers to total regular faculty, externally funded research in the past three years, completed research-based papers published, research-based papers presented, citations, and invention in the past three years. As to KRA 3, which is on services to the community, the university was assessed based on the following indicators: active linkages/partnership with other organizations/educational institutions, community/population served, adopters, and viable demonstration projects in the past three years. Lastly, KRA 4 is on management of resources with indicators such as the average of the total disbursement to total obligations for the last three years; percentage of internally generated income to total subsidy (allotment from the General Appropriations Act) in the past three years; faculty and staff development program; and institutional awards given by reputable organizations in the past three years. Level IV granted by the Commission on Higher Education is a testament that the university is excellent in fulfilling its tri-focal functions of instruction, research, and extension. The highest level in SUC Leveling is Level V, which means the institution is comparable to the best universities in Asia.

Furthermore, the quality assurance arrangements of the university are considered as facilitators in producing quality graduates and programs (Harvey, 2006; Frazer, 2003; Shah, Nair and Wilson, 2011) that contributed to the socioeconomic and innovative development of the region. This is through its graduates, research and extension programs, and linkages. The first indicator to be considered here is the University's governance and management arrangements. Management of operations, financial control, and quality assurance arrangements give the institution the opportunity to respond to development and change. It has an internal control system which refers to the plan of organization and all the coordinated methods and measures adopted within an organization or agency to safeguard its assets, check the accuracy and reliability of its accounting data, and encourage adherence to prescribed managerial policies. The scope of coordinated methods and measures include the human resource management system, financial management system, quality management system, and control policies and procedures.

In due recognition of the quality, timeliness, and accuracy of its financial reports, the Commission on Audit has chosen the university accounting office as one of the most outstanding accounting offices in 2014 and 2016, awarded by the Association of Government Accountants of the Philippines, Inc. This provides evidence of the effectiveness of the university's quality assurance arrangements, particularly in the aspects of accountability, financial control, and effective monitoring of performance.

Moreover, to support management, the University has enabling features that help improve the operations, quality, and development, like the use of information and communication technology (ICT) for more efficient and effective management; viable, sustainable, and appropriate resource generation strategies to support its development plans.

**3.2. Quality of Teaching and Learning, Quality of Professional Exposure, Research, and Creative Work.** The University's quality of teaching and learning is ensured through its quality assurance arrangements. Instruction is mainly anchored on design thinking that equips students to innovate, and its effectiveness is evidenced by the course/program outputs the students put on exhibit during university's innovation summits or the outputs they field during national and international competitions. Recently, two entries of the University were among the top 30 semifinalists in the 5<sup>th</sup> Philippine Startup Challenge. This refers to the BFree of Technovators and Filipino Time of the Catulong Team. The latter is an innovation made by Erique Gallardo, featuring a smartphone that charges through special cellphone casings and without wire adaptors. Meanwhile, Capulong's Filipino Time is a mobile application that enables users to manage appointments through an alarm system.

As a result of these quality assurance arrangements, the University was granted the following: CHED Center of Excellence in Information Technology per CHED Memo Order No. 38, Series of 2015 (The only Institution in Mindanao awarded with such recognition); CHED Center of Development in Mathematics per CHED

Memo Order No. 38, Series of 2015, and CHED Center of Development in Electrical Engineering per CHED Memo Order No. 37, Series of 2015. On top of these accomplishments is the SUC Level IV with only 19 institutions granted such recognition nationwide.

Other evidences of the effectiveness of the University's quality assurance arrangements include the performance in the licensure examinations for the past five years that are way above the national passing percentage (except one program). Also, the institution takes pride of the accreditation of its programs by the Accrediting Agency of Chartered Colleges and Universities in the Philippines, Inc. At least 86% of the accredited programs are Level 2.

It is worth noting that the university was awarded the Seal of Good Implementation Institutional Award by CHED in recognition of its achievement of 80.9% (163 of 204) of Expanded Students' Grants-in-Aid Program for Poverty Alleviation grantees who graduated in April 2016. Out of 40 SUCs in the entire Philippines, only 8 were given such awards with 2 SUCs coming from Mindanao.

As to research publication, the Mindanao Journal of Science and Technology is listed in the ASEAN Citation Index database, along with 46 other Philippine journals. This means that research articles published in the journal can now be accessed through the said index. This is especially helpful for persons in research since there is now a higher probability of increasing the journal's citation count. The inclusion in the index is just another addition to journal's achievements. The journal has already been recognized by the CHED as a grantee of its Journal Incubation Program. It is also listed in the Emerging Sources Citation Index (ESCI) under the Web of Science Core Collections of Clarivate Analytics, an international indexing database.

**3.3.Support for Students.** One way of providing support to the students is through the Career Center and Industrial Relations Office. Its main goal is to guide students in identifying career opportunities that match their skills, interests, personality, and values, leading to meaningful and purposeful contributions to the global industry. It also promotes academe-government-industry collaborations through programs and activities such as the Career Readiness Program, Boutique Career Fair, Job Expos, and USTPLink among others. USTPLink facilitates a system connecting USTP alumni directly with employers and/or partner industries of the University.

**3.4.Relations with the Community.** The university also forged linkages with over a hundred industry and community partners. These networks imply that the university is recognized as a valued partner by the community it serves. One example that can be cited here is the memorandum of understanding between the university and the USAID Science, Technology, Research and Innovation or Development (STRIDE) signed on May 9, 2019. It serves as a venue to openly discuss the future programs and undertakings of the career center, including steps on addressing skill mismatch, as well as maintaining a competitive edge against other schools in the Philippines.

Another mechanism to strengthen relations with the community is through *Learning Express (LeX)*. LeX is an International Social Innovation Programme by Singapore Polytechnic that provides students with the opportunity to experience the natural world, learn new skills, make meaningful new friendships, and rediscover themselves through out-of-classroom learning. Every year, Singapore Polytechnic sends 22 to 25 Singaporean students together with three faculty members to USTP-CDO to do the Social Innovation Project with 22 to 25 university students and three faculty members who will act as LeX facilitators. This international partnership was sealed by a Memorandum of Understanding that specified for six Learning Express implementations scheduled every September and March of the school year. In Asia, LeX is also implemented by universities in Malaysia, Vietnam, Indonesia, and Japan. It is anchored on design thinking methodology which is a useful tool in coming up with innovative ideas and products. The 14-day Learning Express program brings students in a multi-national, multi-cultural, and multidisciplinary setting to design innovative solutions to problems faced by communities around Southeast Asia.

### **3.5.Contribution to the Socioeconomic and Innovative Development of the Region**

This section discusses the socioeconomic and innovative contributions of the university in regional development. The first that can be cited here is the *Northern Mindanao Food Innovation Center*. The center is committed to providing innovative technologies and relevant support services for inclusive and sustained development of the local food industry. It also aims to produce value-added and innovative food products in collaboration with the Department of Science and Technology, Department of Trade and Industry, Food Processors Association of Northern Mindanao, and the House of Representatives of the Philippines, among others. The Center's services include consulting and advisory, training, and product development.

For 2019, partnerships were established with the Food and Agriculture Organization, of the United Nations, Life Project 4 Youth, City Agriculture Office, Local Government Units, Department of Science and Technology Food and Nutrition Research Institute, Farmer Organizations and Cooperatives. The center also received the Food and Drugs Administration-Land Transportation Office certification as a food manufacturer with USTP as the owner and with license valid until April 15, 2021. From the start of the center in 2015, it has already assisted 1,098 satisfied startup businesses (see Table 2) and 566 faculty and students in the university.

Table 2. Food Innovation Center-assisted Businesses and SMEs

Type of Services	2015	2016	2017	2018
1. Product Development	4	40	30	40
2. Packaging and Labelling	23	26	37	40
3. Laboratory Testing	1	15	11	3
4. Technology Hub	0	0	0	0
5. Intellectual Property Rights (Referral to ITSO)	1	4	6	0
6. Training Programs	0	1	13	19
7. Consultancy/ Advisory	20	28	55	73
8. Facilitation of conventions, expositions and trade fairs	0	9	2	0
9. Facilities and equipment	61	120	212	204
<b>Total:</b>	<b>110</b>	<b>243</b>	<b>366</b>	<b>379</b>

The second contribution that can be mentioned here is the *Affiliated Renewable Energy Center*. Pursuant to Republic Act No. 9513, otherwise known as the Renewable Energy Act of 2008, the law provides for the state to encourage and accelerate the exploration, development, and increase the utilization of renewable energy resources. These renewable energy resources are generated through biomass, solar, wind, hydropower, geothermal, ocean energy sources, and including hybrid systems. In implementing this law, the Department of Energy taps the academic institutions to be Affiliated Renewable Energy Centers in order to realize the Renewable Energy Act of 2008. Fortunately, the university passed the evaluation process conducted by the department last June 1-2, 2015, recognizing the University as a duly accredited affiliated renewable energy center.

Moreover, the department the potential of the university in terms of expertise, resources, and contributions in ensuring proper and effective formulation, implementation, and evaluation of programs, projects, and activities that are responsive and complementary to the ever-changing needs of the stakeholders in the area and clientele in the renewable energy sector in the Philippines. The memorandum of agreement signed between the university and the Department of Energy on the establishment of an Affiliated Renewable Energy Center provides evidence for this claim.

The third contribution is through research. The University's research includes a broad gamut of scholarly and creative research activities/projects undertaken by faculty, staff, and students that lead to original findings, product, and innovation. Research activities are designed to solve problems in the community and improve the quality of life of the people. Figure 1 illustrates the number of research projects conducted for the last five years for both institutionally and externally funded research.

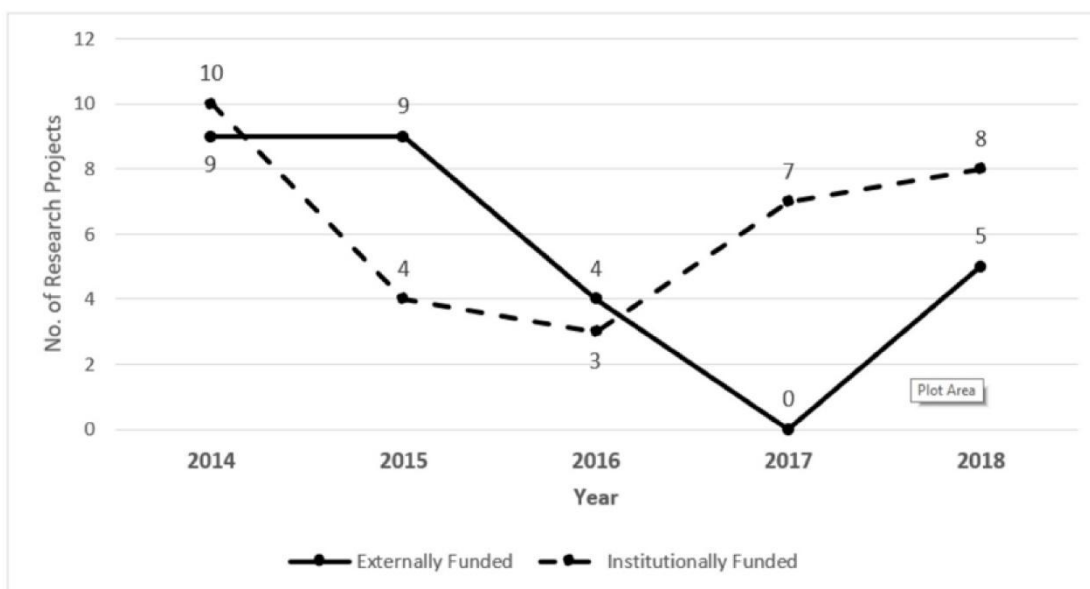


Figure 1. Completed research projects for the last 5 years

Moreover, Figure 2 displays the externally funded completed research projects by college. The figure shows that the College of Science and Mathematics has the most number of externally funded research, followed by the College of Engineering and Architecture.

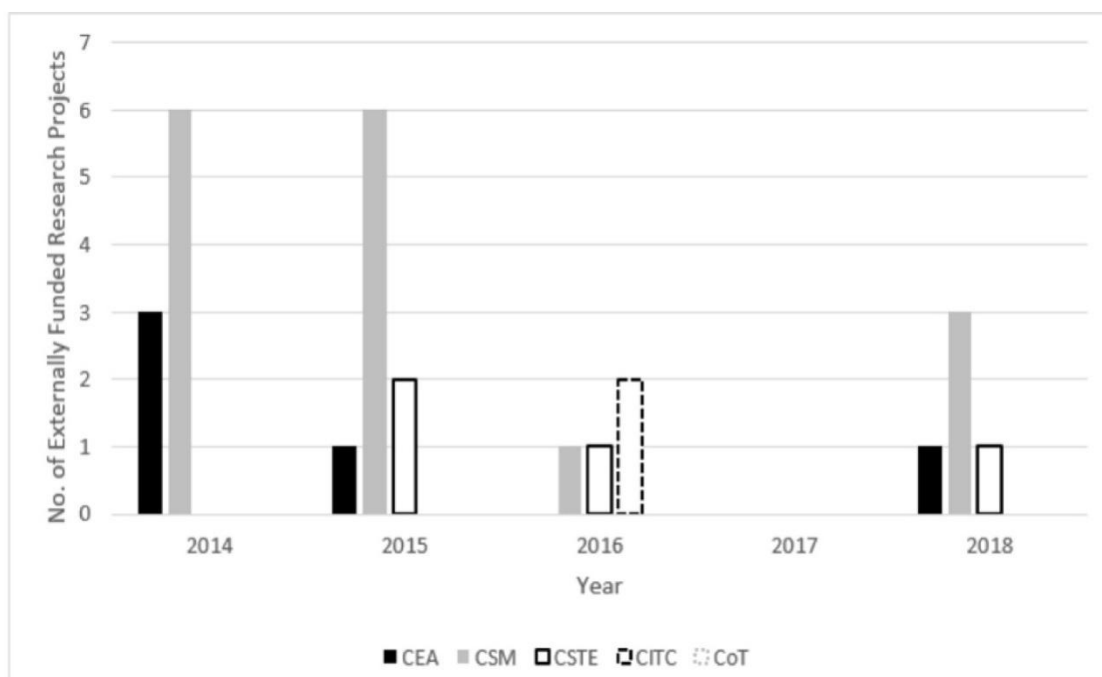


Figure 2. Externally funded completed research projects for the last five years (by college)

As to the institutionally funded research projects per college (please refer to Figure 3), the figure shows that still the College of Science and Mathematics has the most number of institutionally funded researches but then followed by the College of Science and Technology Education. It must be noted here that USTP-CDO was recognized by CHED as having one of the best research programs in the country. Some examples of these studies are the CHED-funded study on the Environmental Impact Assessment of Mercury Contaminated Environs due to

Mining Activities in Barangay Gango, Libona, Bukidnon. It is expected to influence legislation that would protect the environment and the community. The total grant amounted to Php 11,419,840.00.

Moreover, another study is on the Indigenous Knowledge System on Plant Utilization by Selected Indigenous People and Ethnic Group in Northern Mindanao with funds coming from the National Commission for Culture and the Arts in the amount of Php 9,939,444.00. The results of this study would not only promote and preserve culture, but will also have some policy implications. These studies conducted with large external funds attest to the capability of the university to contribute to regional development through research.

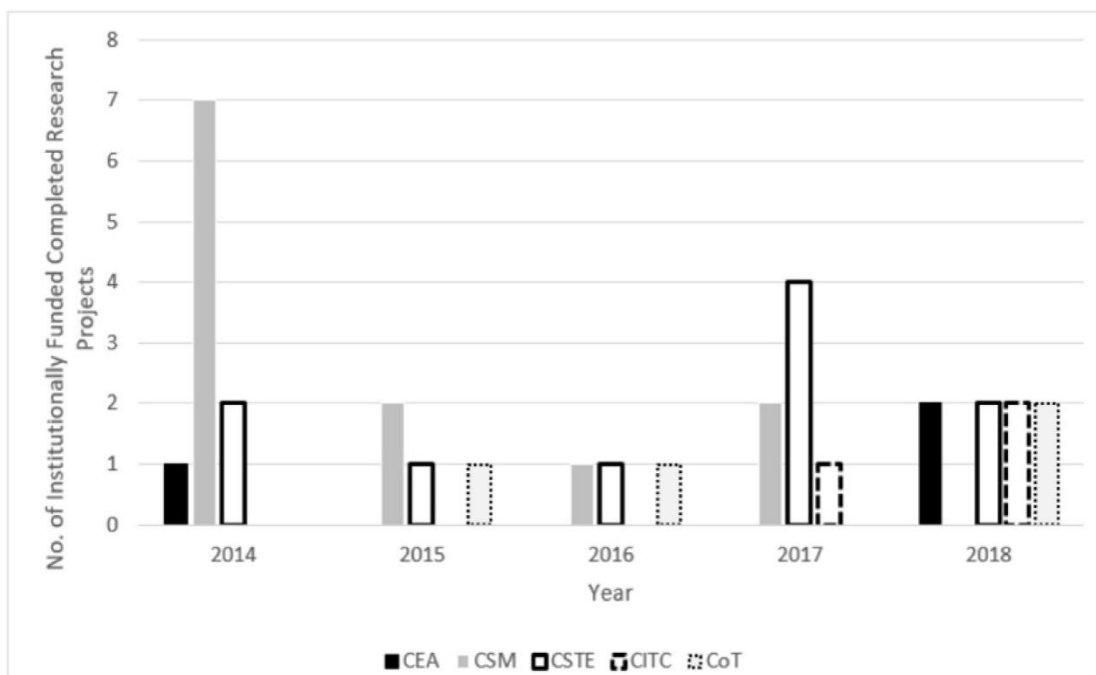


Figure 3. Institutionally funded complete research projects for the last five years (by college)

**3.6. Innovative contribution to regional development.** The university has the mandate to create innovations that spur the creation of new products and business organizations or expansion of existing businesses, and research/expertise that provides technology solutions to current and pressing industry problems, locally as well as internationally in accordance with the USTP Strategic Plan 2030. In compliance with this mandate, the institution hosted the second innovation summit in 2019. It gathered gathered investors, industry senior executives, academe, and entrepreneurs in Cagayan de Oro City to explore challenges and opportunities in the fields of power and energy, food innovation, and information and communications technology. The event also showcased digital initiatives, students and faculty research outputs, extension services, food innovations, and knowledge products of university students as well as services of various startups from the USTP Digital Incubation Hub. It highlighted the pitching of top technopreneurship students and graduates of the university Digital Incubation (CDO Bites) of their ideas/products/services to possible investors. Exhibits for energy, industry, and emerging technologies include the Portable Biogas System, Portable Coco Sugar Processing Machine, Multi-Commodity Dryer System, Floating Stream Water Wheel Pump, Portable Spray Dryer, Electric Bicycle for Urban Mobility, and Solar Powered Smart Indoor Hydroponic System with Geothermal Cooling, among others.

Moreover, exhibits under information and communication technologies include: Integrated ICT-based Platform: Soil Fertility Monitoring System Using Image Processing and Artificial Neural; Development of Sensor-Triggered Multi-Camera Image Capturing Remote Monitoring System; Car Temperature and Child Safety Monitoring System via SMS Notification and Android Application; and Mobile Application for Waste Management Collection with Optimized Route, to name a few. For food category some examples are: Process Development for a Commercially Viable Ready-to-Eat Banana Blossom (*Musa acuminata colla*) with Coconut Milk in Restorable Pouch and Physico-Chemical, Stability, and Commercial Sterility of Ready-to-Eat Canned “AdobongDabong”



(*Phyllostachyseudulis*), among others. It is evident that events like these provide a platform for the University to contribute to the economic and innovative development of the region. It is also worth noting that post evaluations were made to improve the facilitation of innovation summits.

**3.7.CDO b.i.t.e.s. or the USTP Technology Business Incubation Hub.** The establishment of the CDO b.i.t.e.s. is the Department of Science and Technology's strategy to promote innovation and entrepreneurship for the country's socioeconomic development in a knowledge-based world economy. It primarily aimed at creating jobs, developing entrepreneurs, and promoting public-private partnerships in regional economic development. Since its establishment in 2016, CDO b.i.t.e.s. had already conducted more than 100 events with more than 5,000 participants. Its milestones include 2 batches of incubatees comprising 23 startups and eight graduates, 50,000 pesos private grant, three million pesos government grant for a venture, 600,000 startup revenue for eight startups, more than five jobs per year, and six revenue-earning ventures, among others. Also, the Wela School Systems represented the Philippines in an international innovation event. Its income for 2018 amounted to Php 2,715,535.00, with a net profit of Php 845,504.68 with more than 13 partner schools. Another startup is the Hyperstacks, developed and assisted by CDO b.i.t.e.s. It is a technical consultancy and mobile app development venture. It caters to six countries with 14 projects in its record in 27 months. Mentioned earlier is the BFree of Technovators and Filipino Time of Capulong Team.

**3.8.LISER.** The Low-cost Intelligent STEAM Educational Robot (LISER) is an educational robot aimed to teach robot hardware and programming for kids/high school students. It is designed to be low cost, easy to assemble, easy to use, and easy to program in a kid friendly manner. It was developed by USTP experts Engr. Diogenes Armando Pascua, Engr. Bronson Mabulay and Ms. Aileen Amora. It was made possible with funds from the USAID-STRIDE Prototype Research and Innovation Grants (SPRIG). The grant period was from September 1, 2016 to August 31, 2017. It is envisioned that the prototype will enable more robot-based systems that can be applied in other academic aspects. Team LISER conducted demo training for teachers and students at Lanao del Norte Comprehensive High School, Baroy, Lanao del Norte on December 19, 2016. LISER offers sales, robot design, robotics competition, robotics fablab support, LISER training and workshops, and robotics curriculum development.

**3.9.Development and Utilization of Cagayan de Oro City's Building Permit Management System.** Recognizing the role of ICT in a city's economic growth and development, the Cagayan de Oro City Local Government Unit entered into a partnership with the university and Department of Science and Technology to upscale the whole system of the Office of Building Officials for a more efficient and well-organized procedure in transacting business. The problems encountered by the city include the long processing of public document request, presence of "fixers" in government agencies, and high economic loss. To provide solution to this problem, the University's faculty experts designed the electronic Building Permit Management System. It is an online system for building permits application, evaluation, approval, monitoring, issuance, notifications, and reporting. It is designed for faster processing of building permits via an online application. Its implementation resulted in the reduction of the processing period from five months to three days and that is from 30 to 34 steps to six to eight steps processing. As a result of this innovation, revenue collection increased. In fact, in the first two months alone of this year, the OBO has already collected Php 37.9 million pesos, and which is already 43.83% of the total collection in 2018, amounting to Php 86,389,583.18 million pesos.

Last but not least are the contributions of graduates as part of the region's human capital. One of the measures of SUC Level IV institutions is the employability of graduates. In the absence of a consolidated tracer study, this study focuses on the graduates who answered the survey questionnaires. All of those who accomplished the questionnaires were employed, and some held key positions in their companies or organizations, while others managed their own schools and businesses. A number have acted as resource speakers, facilitators, or moderators in numerous seminars, workshops, and other group activities here and abroad. They also served as consultants for various organizations.

#### **IV. Conclusions**

From the findings, this study concludes that the university has greatly contributed to the socioeconomic and innovative development of the region. This is specifically through its program outcomes as evidenced by its research and technology products, graduates serving in the government and industry, and the centers created that cater to the needs of the industry and community. Its quality assurance arrangements are considered the facilitating factors of

bringing out the program outcomes. From the hard evidences, significant factors include management, enabling features, quality instruction, particularly the design thinking process, professional exposure, research, and creative works. However, based on the assessment of the respondents, the university has to strengthen the implementation of its quality assurance arrangements to ensure its effectiveness. This is with regard to the upgrading of laboratories and more professional exposures for faculty and students. This study concludes that when quality assurance arrangements are in sync with the institution's vision, mission, and goals, it becomes a significant enabler of producing desired school outcomes.

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