The Retrospective Evaluation of the College of Industrial Technology BS and Bit Programs

Karlo S. Sira[1*], Femy B. Estecomen[2], Zumel C. Cadenas[3], Erman G.[4], Gange, Ana V. Ancheta[5], Pacifico N. Senador[6]

[1,2,3,4,5,6] *Iloilo Science and Technology University, La Paz, Iloilo City, Philippines*
Email: [1]karlo.sira@isatu.edu.ph

Abstract

Schomburg and Teichler (2011) stressed that a tracer study is a powerful tool for the HEI's feedbacking to improve its curricular offerings. The primary purpose of conducting this study is to determine the graduate's established demographics of ISAT U CIT's BS and BIT programs from 2018 to 2019. The researchers focused on the academic training and employability of the graduates after graduation. Most of the graduates utilised their knowledge and skills acquired from the programs they came from in their workplace. Others took engineering, architecture, and teaching. Some applied for certification from TESDA for employment abroad. The majority of the graduates were contented, fortunate, and splendid to recommend to their family and friends the kind of education they got in the ISAT U.

Keywords— Career pathways, Curricular offerings and revision, employability after graduation, graduate's tracer study, Iloilo Science and Technology University-College of Industrial Technology, Whereabout of the graduates, and Career pathways

I. INTRODUCTION

Curriculum alignment is significant in attaining learning objectives. However, Higher Education Institutions (HEI) are often challenged by practical problems (Wijngaards-de Meij & Merx, 2018). Proper alignment is achieved by devising a tracer study to determine the whereabouts, career pathways, and employment profile of the graduates during their pre-training services at the University. Gines in Sira, Valenciana, Celda, and Sobrepeña (2018) is the best tool to determine the graduate's outcomes in the workplace. Tracer studies have enabled HEIs to profile their graduates reflecting on the quality of education they provide Pentang, Perez, Cuanan, Recla, Dacanay, Bober, de la Cruz, Egger, Herrera, Illescas, Salmo, Bucad, Jr., Agasa, Abaca (2022). Cañizares (2015) also espoused tracer determinants to the relevance of its curricular programs in meeting the needed human resources. The feedback gathered from the established tool is valuable data for curricular reforms (Nivera, Toledo, Sualibio, Boral, and Asuncion, 2015).

College of Industrial Technology Programs

The Bachelor of Science (BS) and Bachelor of Industrial Technology (BIT) programs of the College of Industrial Technology (CIT) of the Iloilo Science and Technology University are the flagship programs of the CIT. These programs prepare students for entrance to and advancement in the middle-level technical position in the industry between tradespeople in the workshops and the engineers or technologists (MECS Order No. 32, s. 1982). The academe graduates are expected to become middle-level technicians who can work with minimal supervision because of their sufficient management skills acquired from the professional subjects. On the other hand, the Office of Programs and Standards Development (2017) designed new Program and Standard Guidelines (PSG) on Industrial Technology to prepare students for a higher industrial workforce equipped with technical, managerial,

research and entrepreneurial competencies in the different fields in industrial technology.

Iloilo Science and Technology University is one of the Philippines' leading universities in science and technology. It envisions producing quality and competent graduates to work in the respective workplaces here and abroad. The CIT, one of the banner colleges of the University and the top producer of technology graduates in the country, continues to align its program offerings to meet employers' demands. Under this College are two programs, the Bachelors (BS) and Bachelors of Industrial Technology (BIT). The BS offered Automotive (BSAT), Electrical (BSELT), and Electronics (BSELX), while the BIT majors in Automotive (BIT AT), Architectural Drafting (BIT DT), Civil (BIT CT), Electrical (BIT ELT), Electronics (BIT ELX), Mechanical (BIT MT), Heating-Ventilating and Airconditioning and Refrigeration (BIT HVAC-RT), and Fashion and Apparel (BIT FAT). After graduation, the graduates of these programs are expected to (ISAT U Curriculum Manual, 2017):

- Analyse broadly-defined industrial technology processes by using analytical tools enhances creativity, innovativeness, and intellectual curiosity to improve methods, techniques, and systems that meet the industry standard.

- Design and implement broadly-defined industrial systems, components, products or processes to meet specific industry needs with proficiency and flexibility in the area of specialisation under global standards.

- Apply appropriate techniques, resources and state-of-the-art industrial technology tools to meet current industry needs and use these modern tools and processes to improve and increase entrepreneurial activities upholding the safety and health standard of business and industry.

- Communicate with diverse clientele groups the appropriate cultural language with clarity and persuasion, in both oral and written forms, including understanding and giving clear instructions, high comprehension level, effectiveness in delivering presentation and writing documents, and articulating technological innovations output.

- Develop leadership skills in a team-based environment by making informed decisions, keeping the team motivated, acting and delegating responsibility and inspiring positive changes in the organisation by exercising responsibility with integrity and accountability in one's profession.

- Practice the moral responsibilities of an industrial technologist to manage and balance broader public interest and uphold the norms and safety standards of the industrial technology profession.

- Demonstrate enthusiasm and passion for personal and professional development in broadly-defined industrial technology and effecting positive changes in the entrepreneurial and industrial endeavour.

Why Trace After Graduation?

The main reason for tracing the graduate is to respond to the latest developments in society. It was the time when the Commission on Higher Education mandated all Universities to track their graduates after graduation to determine whether these graduates had been working in the target industry. Along with this calling, the system-wide curricular revision is also in action, transforming Competency-Based Education (CBE) into Outcomes-Based Education (OBE). So, OBE format syllabi were utilised to support the K-12 program of the Department of Education. The revisions are according to one standard policy to ensure uniform processes and procedures that guarantee the relevance, excellence, and cost-effective higher education programs specific to technology courses. Some of the legal bases were:

- ASEAN Integration Report (2015) aims to develop human resources through closer cooperation in education and lifelong learning and in science and technology for the empowerment of the peoples of the ASEAN and the strengthening of the

- collaboration among the ASEAN Community.
- Republic Act 7222, otherwise known as the "High Education Act of 1994" (Republic Act, 1994). Accordingly, CHED shall set a minimum standard for programs and institutions of higher learning (section 8d).
- Executive Order No. 83, s. 2012, the "Institutionalization of the Philippine Qualification Framework (PQF)" mandated the adoption of national standards and levels for education outcomes. SUCs must develop and maintain pathways and equivalencies as access to qualifications. Help students move quickly and readily between the different education and training sectors and between these sectors and the labour market. The PQF directs the alignment of national and international qualifications to support the global mobility of workers equally recognised and valued by the other countries.
- CHED Memorandum Order No. 46 (2012), entitled "Policy-Standard to Enhance Quality Assurance (QA) in Philippines Higher Education through an Out-comes-Based and Typological-Based QA", discusses the role of the state in providing quality education to its citizens.
- Resolution No. WVCST BOT 05/16/2008 known as One System One Standard (OSOS), which shall serve as the uniform basis for all streaming of curricula offerings both on the main and external campuses.

Tracer study in conformity with Intrac.org (2017), the data collected and analysed regularly. It is designed for monitoring and evaluation purposes - to track changes at the individual level and followed by an actionable intervention. Particularly in HEIs, this is a powerful tool for feedbacking that will lead to academic reforms. ETF.europa.eu (2017) gives a comprehensive definition that tracer studies can provide important information about skills matching; horizontal (relevance of the field of study for the tasks done in the job) and vertical (appropriate position regarding the level of formal qualification) in combination with intrinsic and extrinsic data from the graduates. Also, they can help to answer questions such as:

- What happens to graduates after leaving the education institution?
- Were they able to get paid employment at a good time?
- Do they use the skills and competencies they have acquired in their education/training? If not, why?
- What are the skills and competencies required by the labour market?"

As Badiru and Wahome (2016) pointed out, a meaningful and successful tracer study uses accurate data from the employment characteristics, which served as a vital source of information. The ILO Thesaurus (2005) in Millington (2008) defines a tracer study as an impact assessment tool where the "impact on target groups is traced back to specific elements of a project or programme so that effective and ineffective project components may be identified." Millington added that in "educational research, the tracer study is sometimes a graduate or alumni survey since its target group is former students." With these processes, ETF.europa.eu (2017) suggests that educational institutions and stakeholders' should actively participate in designing the questionnaire for data accuracy.

Meanwhile, the Wijngaards-de Meij and Merx (2018) strongly believe that their "tool has contributed to a collaborative and cooperative curriculum review and improvement approach. It is a venue that allows different stakeholders to be heard in the discussion and prevents curriculum review and development from being reduced to a top-down exercise in the dominant logic of outcome-based education."

Graduates to Employability

McQuaid and Lindsay (2005) described the working definition of employability from different views from different labour unions. The Confederation of British Industry (CBI) (1999) has defined employability "as the possession by an individual of the qualities and

competencies required to meet the changing needs of employers and customers." These attributes will realise one's aspirations and potential in work."

The United Kingdom Government HM Treasury (1997) defined "employability as developing skills and adaptable workforces. Capable workers are encouraged to develop the skills, knowledge, technology, and adaptability to enter and remain in employment throughout their working lives." While in The Canadian Government's Labour Force Development Board (1994), employability is the relative capacity of an individual to achieve meaningful employment given the interaction of personal circumstances and the labour market (Northern Ireland Executive DHFETE, 2002) has explicitly suggested that a wide working definition of "employability is the capability to move into and within labour markets and realise potential through sustainable and accessible employment. For the individual, employability depends on the knowledge and skills they possess and their attitudes; the way personal attributes are presented in the labour market; the environmental and social context within which work is sought; and the economic context within which work is sought." Employability relates to preparing students to negotiate graduate life and work and understanding the future's employability behaviour (Bennett, 2018),

The experiences brought by employability tell the successes and failures of a graduate. Nivera, Toledo, Sualibio, Boral, and Asuncion's (2015) study espoused that 95% of the PNU graduates were "felt great, proud, privileged, blessed, confident, and honoured to be graduates of the top teaching institution in the Philippines." The group of Gagalang, Tibay, and Matela (2017) believed that AB English and AB Political Science graduates' curricula had prepared them for the labour market. They were satisfied and felt safe in their working place. Moreover, Rogayan (2019) stressed that the global labour market is upgrading. The University is preparing its graduates to "embrace the challenges and opportunities of Education 4.0 by producing industry-ready and globally competitive graduates."

Purpose of the Research

This study aimed to review and evaluate the BS and BIT programs of the College of Industrial Technology through a tracer study of its 2019 graduates.

Specifically, it sought to:

1. determine the profile of the BS and BIT programs of the CIT graduates in 2019 as to sex, residence, civil status, campus graduation, course, employment status, and job experience; and
2. identify "recommendations for the improvement of the tertiary education curriculum of the University."

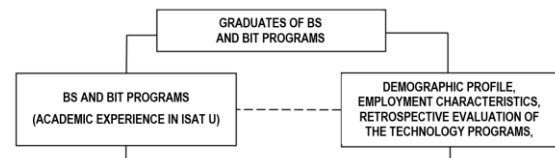### *Conceptual Framework of the Study*

Figure 1. The Conceptual Framework of the Study

The study's conceptual framework in Figure 1 depicts the variety of experiences the two programs in technology to prepare them for the world of work. In theory, if the University transfers the required underpinning competencies to the students, they may be able to find the right job for the right skills acquired during their stay in the CIT. The College has eight technology majors for the BIT program: Automotive (AT), Architectural Drafting (DT), Civil (CT), Electrical (ELT), Electronics (ELX), Mechanical (MT), Heating-Ventilating and Airconditioning and Refrigeration (HVAC-RT), and Fashion and Apparel (FAT) while the Bachelor of Science in Industrial Technology (BS) has three majors offered: Automotive (BSAT), Electrical (BSELT), and Electronics (BSELX). The expected output of the study includes the established demographic profile of the graduates, the employment characteristics, and the retrospective assessment of the BS and BIT programs. This tracer study's valuable information may provide the internal and

external factors essential today for academic and industry curricular reforms.

Methodology Research Design

This study employed a descriptive survey including demographic profile, employment status, and job experiences of the technology graduates. It is noteworthy to document the gathered data for curricular offerings' evaluation, its usefulness, relevance, applicability, and adequacy of the underpinning competencies of the graduates to the objective of the vision, mission, goals, and objectives of the two programs.

Respondents and Sampling Plan

The researchers utilised both qualitative and quantitative data from 11 technology majors. Due to the pandemic administering hard copies of questionnaires is not possible. Instead, the researchers opted to use the google forms to gather data from the respondents by sending links to graduates' emails and group chats to answer the questionnaire. Additionally, the researchers choose snowball sampling to come up with 205 participants. "Snowball sampling is a sampling method used by researchers to generate a pool of participants for a research study through referrals made by individuals who share a particular characteristic of research interest with the target population." Frey (2018) demarked this sampling as chain sampling or chain referral sampling." Data from the Registrar's office was used for the survey. The target participants are graduates from 2019 who responded through email, call interviews, and google forms. Online applications are the best way to track the program graduates.

Instrument and Data Gathering Procedure

A modified instrument developed by Echaveria, Tucar, Belmes, Subosa (2007); Nivera, Toledo, Sualibio, Boral, & Asuncion (2015); Sira, Celda, Sobrepeña, and Valenciana (2018) and CHED format tracer study questionnaire used to obtain quantitative and qualitative data from the responses of the graduates regarding their training competencies in the undergraduate program, employment status, job experiences and program's retrospective evaluation.

Significant items were included in the prepared questionnaires to gather data online. The researchers uploaded the questionnaire in the google application using google Forms. Furthermore, links were sent to the participants. Moreover, another method is through interviews and email. Hence the researchers gathered 205 participants.

II. DATA ANALYSIS

The data gathered were computer-processed using MS Excel and Statistical Package for Social Science (SPSS) Version 22. The researchers adopted a tally scheme for each item for statistical processes. In analysing the results, the researchers used the frequency count and percentage. The frequency count and rate used established the demographic and employment profile of the participants. All hypotheses were tested at the .05 level of significance.

III.RESULTS AND DISCUSSIONS

Due to poor responses from the participant, the tracer study yielded only 205 participants from the 2018-2019 graduates. The pandemic affects the retrieval of the questionnaires from face-to-face and thru the google forms approach. Although links were sent to their group chats or emails, participants tended to overlook the message. Also, the questionnaire will consume time to answer the needed questions. Although all the participants responded online, 88% of the participants quantitatively answered the items thoroughly, and 12 per cent skipped one or more questions, particularly in post-graduate education and some of the open-ended questions, which asked for valuable information on advanced education curricular improvements. The following figures were presented to show the personal, employment, and educational knowledge of the BS and BIT program graduates.
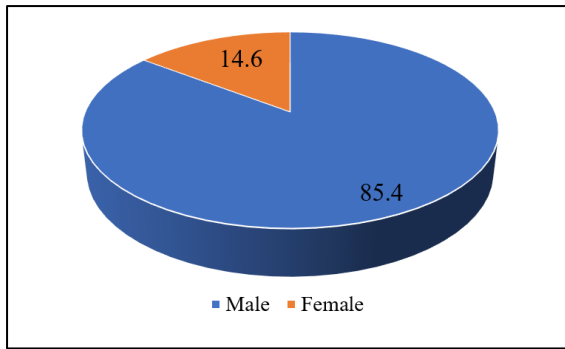
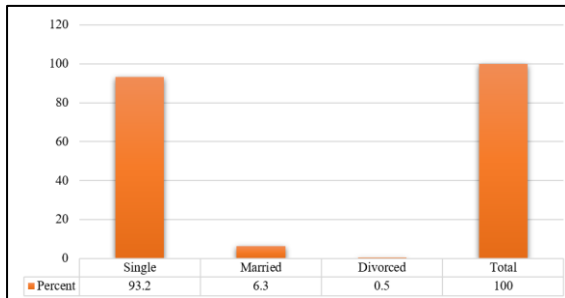### Participants' Personal Information

Figure 1. Sex.

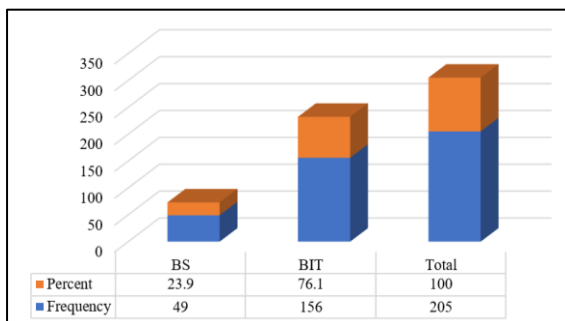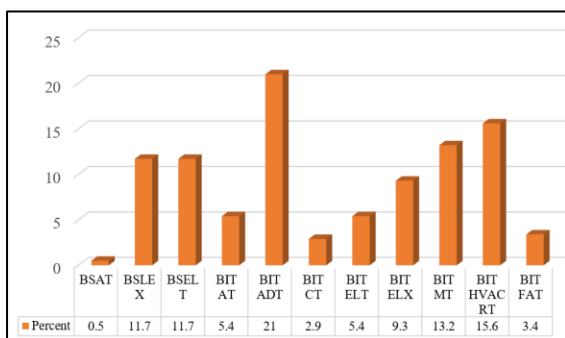*Figure 2. Civil Status.*

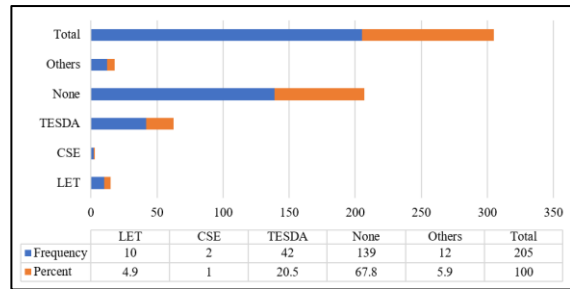*Figure 3. Programs.*

Figure 4. Majors.

Figure 5. Examination Passed.

Of the 205 total participants, Figures 1-5 show that most were male (85.40%), single (93.20%) from the BIT program (76.10%), and majoring in Architectural Drafting Technology (ADT) (21.00%). Although BS and BIT programs are non-board programs, some passed the Technical Skills Development Authority (TESDA) (20.50%), Licensure Examination for Teachers (LET) (10.00%), and Civil Service Examination (CSE) (2.00%).

Employment's Information
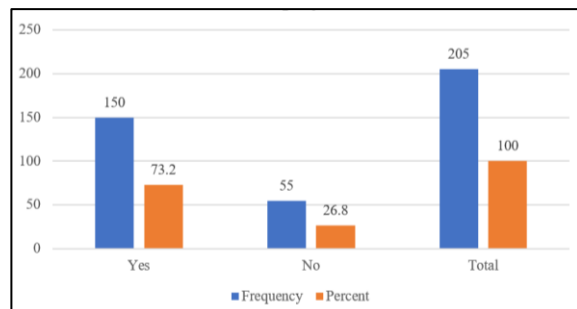
Figure 6. Employed or Not?
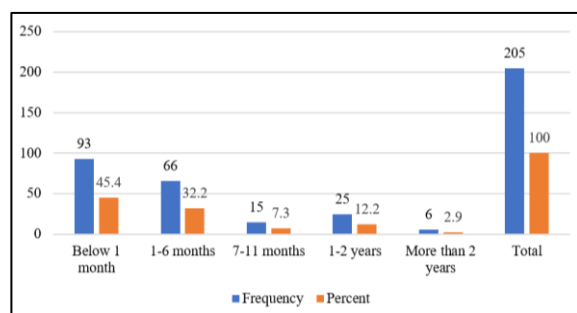
Figure 7. The Waiting Time to Find the First Job.
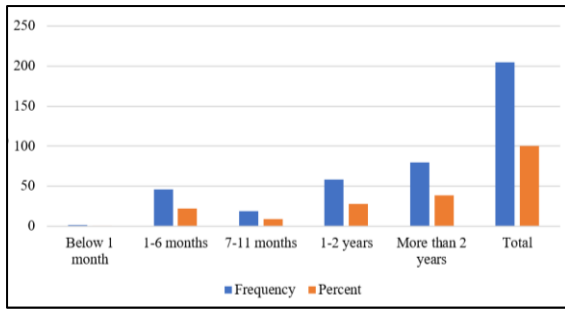
Figure 8. Length of Service in the Job.

Figure 9. Present Job.

Figure10. The Employer.

Figure 11. Employment Status.

Figure 12. Employment Location.

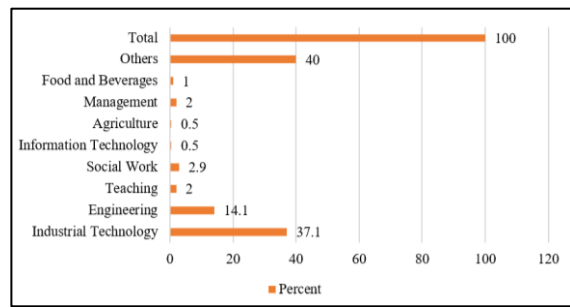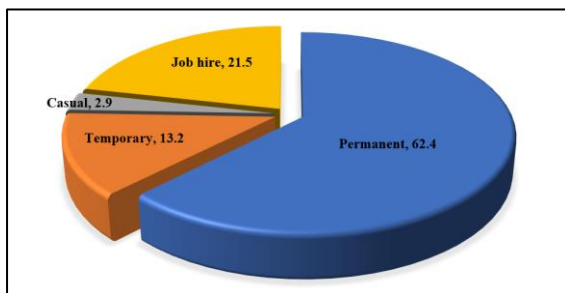*Figure 13. Means to Finding the Job.*
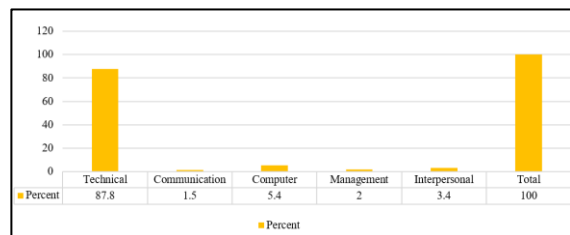

Figure 14. The Nature of Work.

Figure 15. The Skills Acquired in the Course that is Helpful in the Job.
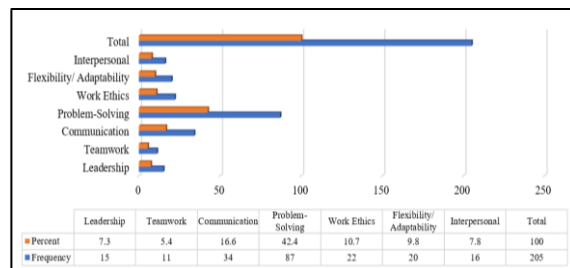

Figure 16. Suggested Additional Skills to Enhance Programs/Course.

Figures 6-16 show the participant's employment information on employment status, waiting time, length of service, present job, employer, location, means of hiring, nature of work, acquisition skills helpful in the job, and skills to enhance the program. The employment characteristics of the participant show that the majority of whom are employed (73.20%), waited below one month (45.30%), stayed for more than two years (80 or 39.00%), worked as a manager (27.30%), technician (22.40%), and draftsman (11.20%) in the private offices (79.50%) as a permanent employee (62.40%), locally based (80%) in the Iloilo City and its provinces. Moreover, these participants find their job thru others (29.80%) and advertisements (27.80%). The other responses mean they were hired after their on-the-job training (OJT). Regarding the nature of work, others (40%) got the highest rate, followed by industrial technology works (37.10%). In this context, industrial technology jobs are categorically assigned to their field of specialisation. On the other hand, others revealed a position not explicitly identified from the given options. It is significant to ask them what skills acquired from their stay in the technology programs benefitted the most. Their response was on the technical aspect (87.80%), meaning the competencies given to them were considered helpful and valuable to their present jobs. Lastly, when graduates were asked to suggest what additional skills are needed to enhance the program, they responded that problem-solving (42.40%) is necessary to the workforce.
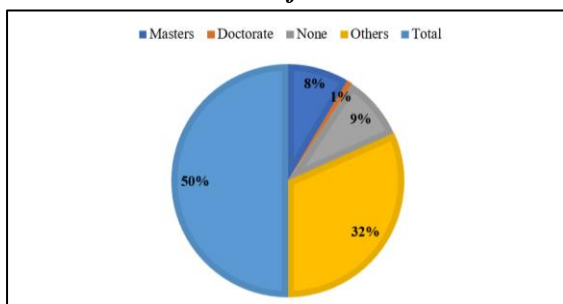
Advanced Education Information

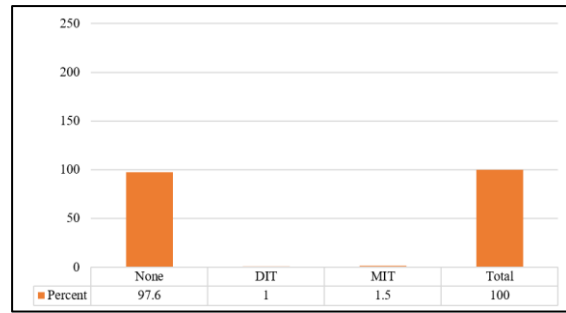*Figure 17. As to Post Graduate.*

Figure 18. As to Post Graduate Status.

Figure 18 shows the ongoing advanced education information of the technology graduates is none (97.60%) got the highest rate. Only one or two graduates pursue post-graduate courses after graduation, maybe because they were the family's breadwinner, shifted from other classes, or are content with their status.
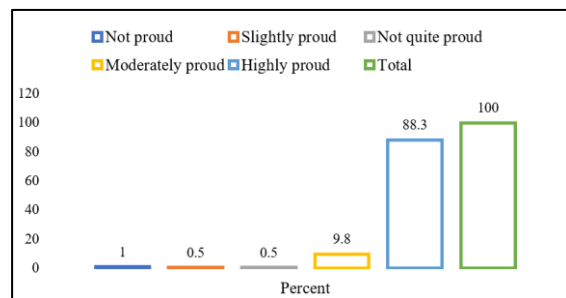
Other Concerns

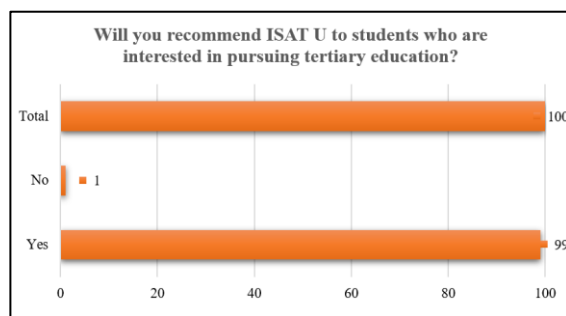
Figure 19. As to Being Proud as a Graduate.

Figure 20. As to Recommend ISAT U to other Students.

Figures 19-20 show the overflowing feelings about their retrospective experience in the CIT. The majority would say that they were highly proud (88.30%) and satisfied graduates of the BS and BIT programs. Besides, they will recommend (99.00%) it to their friends, coworkers, and relatives to

take technology courses at the CIT and ISAT U. True to its vision to become "The leading University in Southeast Asia in 2030." Indeed, CIT had made them proud to say that they were products of the country's best technological University. On how to improve the CIT programs offerings since the technology is dynamic and fast-changing. To wit:

"Invest in state-of-the-art equipment, industry-based hardware and software for all technology courses and train the faculty to ensure the quality teaching-learning processes and adapt their skills to modern technology."

"Invite industry partners, stakeholders, and graduates to look into the curricular revisions and enhancements for these group determines the real scenario of the world of work."

"Hire a highly competent faculty with skills in the industry so that the same level of knowledge and skills are transferred to the students who are crucial to their employment."

"Support students' activities on academics and non-academics and internship programs which are also helpful in their job to develop excellent managerial skills."

"Strengthen the problem-solving activities inside the classroom because it is essential when a critical situation arises.

"Integrate soft skills in the classroom activities because it is essential in the job."

Finally, it is noteworthy that the participants were glad and satisfied to have studied and obtained their degrees at the CIT. They believed its programs made them competent and independent technologists in the needing industry.

IV. CONCLUSIONS AND IMPLICATIONS

This study that sought to review and evaluate the BS and BIT programs of the College of Industrial Technology through a tracer study of its 2019 graduates yielded the result that the program graduates were accessible using a unique sample that provided valuable information concerning their pre-service training. The sample consisted of graduates who are male, single, from BIT program major in Architectural Drafting Technology (ADT) took and passed the TESDA National Training Certification Levels, Licensure Examination for Teachers (LET) and Civil Service Examination (CSC). They wish to work in government offices. The majority of the participants were technologists who are permanent and presently employed in the private sector, working waited below a month to find a job – that after two years, they stayed in the position to find a greener pasture. Furthermore, they worked as a manager, technician and draftsman in Iloilo. The best way to be accepted in the job is to give the best in everything during OJT, working happily with the company's colleagues. Therefore, these characteristics of graduates eager to inform their alma mater about their achievements in their respective workplaces through a tracer study.

The unique sample utilised in the BS and BIT programs provides helpful information. However, other crucial information left unrepresented by this study represented by other graduates of the program of different sets of demographic behaviours; hence it is recommended to trace other groups of graduates and add to the information initially yielded by the present tracer study.

The competencies provided to the CIT technology graduates were helpful in their present jobs. Nevertheless, revisiting the offerings is necessary for enhancement, especially in problem-solving and integrating the soft skills in the major subjects. Although BS and BIT graduates are technically competent, they must also possess the attributes and personality traits to achieve more in the workplace.

The retrospective evaluation of the equipment, hardware, and software used in the classroom is mediocre to the industry. However, the

resourcefulness of the faculty to provide quality learning is abundant. Thus, a long-term plan for the modernisation of the classrooms is the priority of each department's faculty to top-level management as part of the annual procurement plan to maintain and continuously deliver quality education to its constituents to meet the demands of the industry.

The majority of the participants were highly proud and happy with what they were doing. They are privileged and honoured to be graduates of the ISAT U. The CIT programs successfully prepared the graduates adequately for the labour force. Instilling in them the love for their profession means that their Alma Mater could attain its vision, missions, goals, and objectives.

The tracer study yields initial evidence indicating the program's strengths and weaknesses, like improving facilities concerning learning to align to the industry's standards congruently. Also, it equipped faculty with skills necessary to develop graduates who are trustworthy, dependable, with leadership, and can work harmoniously with teammates.

V. RECOMMENDATIONS

The researchers proposed the following recommendations based on the findings of the study and conclusions made:

1. Include the yielded result by the present study in the university-wide tracer study with a different set of demographic characteristics.
2. Emphasise the problem-solving activities and soft skills in delivering the lessons in the technology majors. High-quality training provides a backbone to our graduates working in the workplace.
3. Improve the physical facilities, equipment, and instructional resources for faculty and students.
4. Reinforce the skills of the faculty in training to conform with the necessary knowledge and skills required in the industry.
5. Continue tracking the technology graduates for curricular enhancement to

continually aligned to the industry's demand.

The researchers embarked on increasing the conduct of the tracer study on adequacy and applicability of the teaching methods taught, assessment of the physical facilities and human resource services. Their satisfaction with the current profession regarding salaries and added the information to the results yielded the present tracer—furthermore, a constant revisit of the curricular offerings to congruently align with the industry's practices.

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