

EVALUATING INFORMATION TECHNOLOGY CURRICULUM OUTCOMES FOR 21ST CENTURY IT EDUCATION AND DEVELOPMENT

Ruth A. ORTEGA-DELA CRUZ*, College of Public Affairs and Development,
University of the Philippines Los Baños, Philippines

Ramiro Z. DELA CRUZ, College of Computing Studies, University of Cabuyao, Philippines

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Abstract: The rapid advancement of digital technologies, automation, and industry-driven innovation has significantly transformed the global information technology (IT) landscape in the twenty-first century. As industries increasingly demand graduates who possess not only theoretical knowledge but also practical, technical, and problem-solving competencies, higher education institutions are challenged to ensure that their academic programs remain relevant and responsive to workforce needs. Despite the implementation of outcomes-based education in the Philippines, limited studies have examined how effectively the Bachelor of Science in Information Technology (BSIT) curriculum develops and applies industry-relevant competencies among graduates. Addressing this research gap, the study utilized a survey research design and purposively sampled IT professors and program graduates to evaluate the outcomes of BSIT curriculum in the Philippines. The study provides concrete evidence regarding the extent to which specific program outcomes have been achieved and applied by graduates in their present employment. Findings reveal that although most identified program outcomes have been attained and performed excellently by graduates, certain competencies still require greater emphasis to support holistic IT education. The implications of the study underscore the crucial role of higher education institutions in preparing graduates for the workplace, particularly in response to the continuously evolving demands and expectations of employers who increasingly prioritize practical competencies over purely theoretical knowledge. These findings highlight important steps toward bridging gaps in the outcomes of the BSIT curriculum and may serve as a basis for developing twenty-first-century IT professionals capable of contributing to sustainable IT development in a developing country.

*Autor pro korespondenci: raortegadelacruz@up.edu.ph

Key words: curriculum development, education, information technology, outcomes, twenty-first century.

HODNOCENÍ VÝSLEDKŮ KURIKULA INFORMAČNÍCH TECHNOLOGIÍ PRO VZDĚLÁVÁNÍ A ROZVOJ IT VE 21. STOLETÍ

Abstrakt: Rychlý rozvoj digitálních technologií, automatizace a inovací řízených průmyslem výrazně proměnil globální prostředí informačních technologií (IT) v jednadvacátém století. Vzhledem k tomu, že průmyslová odvětví stále více požadují absolventy, kteří disponují nejen teoretickými znalostmi, ale také praktickými, technickými a problémově orientovanými kompetencemi, čelí vysoké školy výzvě zajistit, aby jejich akademické programy zůstaly relevantní a reagovaly na potřeby trhu práce. Přestože bylo na Filipínách zavedeno vzdělávání založené na výstupech (outcomes-based education), jen omezený počet studií zkoumal, nakolik efektivně kurikulum bakalářského studijního programu Bachelor of Science in Information Technology (BSIT) rozvíjí a uplatňuje kompetence relevantní pro průmysl mezi absolventy. Za účelem zaplnění této výzkumné mezery studie využila výzkumný design založený na dotazníkovém šetření a účelově vybrala profesory informačních technologií a absolventy programu, aby vyhodnotila výsledky kurikula BSIT na Filipínách. Studie poskytuje konkrétní důkazy o rozsahu, v jakém byly specifické výstupy programu dosaženy a uplatněny absolventy v jejich současném zaměstnání. Zjištění ukazují, že ačkoli většina identifikovaných výstupů programu byla dosažena a absolventi je vykonávají na vynikající úrovni, některé kompetence stále vyžadují větší důraz, aby podpořily komplexní IT vzdělávání. Důsledky studie zdůrazňují klíčovou roli vysokých škol při přípravě absolventů pro pracovní prostředí, zejména v reakci na neustále se vyvíjející požadavky a očekávání zaměstnavatelů, kteří stále více upřednostňují praktické kompetence před čistě teoretickými znalostmi. Tato zjištění poukazují na důležité kroky směrem k překlenutí mezer ve výsledcích kurikula BSIT a mohou sloužit jako základ pro rozvoj IT odborníků jednadvacátého století schopných přispívat k udržitelnému rozvoji informačních technologií v rozvojové zemi.

Klíčová slova: rozvoj kurikula, vzdělávání, informační technologie, výsledky, jednadvacáté století.

1 Introduction

Information technology (IT), the study and use of systems for storing, retrieving, and sending information (Frick, 2017) takes a greater role in a nation's responsibility towards its people. And to be able to become effective in the twenty-first

century, people must be able to exhibit a range of functional and critical thinking skills related to information and technology. The fundamental part of IT in almost all sectors, be it in industrial, educational, management or any other conveys its importance in the various walks of life. This makes the role of IT professionals equally significant towards its development.

The field of IT has been growing at a very fast pace over the last few years. This resulted to a serious challenge in the field of IT education especially when the graduates of Bachelor of Science in Information Technology (BSIT) program with required skills and competencies are becoming insufficient (Cofino et al., 2024; Monzon et al., 2022; Ortega-Dela Cruz & Dela Cruz, 2025).

Higher education institutions (HEIs) serve as the vehicle to produce skilled IT professionals to bridge the gap between the changing technology and industry needs. Developing countries like the Philippines are slowly coming to grips with the rapidly changing IT industry and need for IT education and development. Since the HEIs serve as the vehicle by which IT professionals are trained and prepared to meet industry needs, it should therefore be able to produce people to meet the demands of the changing world.

Employers argue that HEI graduates possess general computing knowledge but lack specific skills that industry requires. Not only in the case of developing countries like the Philippines (Patacsil & Tablatin, 2017; (Department of Labor and Employment (DOLE, 2014 in Orbeta et al., 2016), but there is indeed a world-wide issue on labor mismatch and overall skills gap among employees (Brunello & Wruuck, 2021; Kofler et al., 2020; McGowan & Andrews, 2017; Vandeplas & Thum-Thysen, 2019). Similarly, many graduates' expectations of employers differ from employers' expectations of new graduates (Billett, 2018; Kahn & Lundgren-Resentera, 2021; Nagarajan & Edwards, 2015; Sumaya & Ortega-Dela Cruz, 2023; Ugiagbe-Green, 2021; Wilkinson, 2016). On account of this, IT development might take too slow specifically to developing nations.

Putting priorities on the quality and relevance of education is essential in providing graduates the sufficient knowledge, skills, attitudes, and values (Cruz, 2022; Dela Cruz & Dela Cruz, 2020; Ortega-Dela Cruz, 2020; Ortega & Cruz, 2016). Especially critical in the industry demand are the skills and knowledge in IT for nations to have competitive industries and consequently, a prosperous nation. Higher education must ensure that the outcomes of the IT education are translated to the development of Information Communication and Technology (ICT) products and services that are necessary for sustainable ICT development

of the country (Dela Cruz & Ortega-Dela Cruz, 2017). In addition, electronic textbooks, instructional software, email, chat, and distance learning programs which are all becoming highly significant in the twenty-first century.

The country is increasingly driven by an information-based economy where IT knowledge, technical skills, professional experience, and workplace competencies are essential to national development and industry competitiveness. To sustain a pool of qualified IT professionals, IT education and training must continuously evolve through regular curricular calibration and enhancement (Ortega-Dela Cruz & Dela Cruz, 2025). These curricular adjustments should align with the rapidly changing technological demands and emerging competencies required by the IT industry. Moreover, such calibrations must address the existing industry-academe divide, which refers to the gap between the competencies developed in higher education institutions and the actual skills and expectations required by employers in the workplace (Arthur-Mensah, 2020; Zeidan & Bishnoi, 2020). This gap often results in graduates possessing strong theoretical foundations but insufficient practical, technical, and problem-solving skills needed in real-world IT environments (Nyale et al., 2026). Consequently, industries continue to face challenges in becoming more responsive, innovative, and efficient in their operations. Information technology can effectively support these industry needs only if there is a continuous supply of competent IT professionals, and higher education institutions (HEIs) remain committed to producing them. Hence, HEIs must ensure that IT students are holistically prepared and technologically adept, possessing not only technical expertise but also twenty-first-century skills such as critical thinking, collaboration, adaptability, and innovation that are highly valued across industries. In this regard, IT educators play a vital role in guiding and preparing students to become competent twenty-first-century IT professionals capable of meeting the evolving demands of the global workforce.

The Bachelor of Science in Information Technology (BSIT) curriculum plays a pivotal role in shaping the competencies, skills, and knowledge of future IT professionals. In the twenty-first century, where digital transformation, automation, artificial intelligence, and data-driven technologies continue to reshape industries, it is essential to evaluate whether the curriculum remains aligned with the evolving demands of the global IT workforce (World Economic Forum, 2023). In the Philippines, the BSIT program is a four-year undergraduate degree offered under the policies and standards established by the Commission on Higher Education through the Outcomes-Based Education (OBE) framework and CHED

Memorandum Order No. 25, series of 2015 (Commission on Higher Education [CHED], 2015). Admission to the program generally requires completion of senior high school education, particularly strands related to Science, Technology, Engineering, and Mathematics (STEM), although graduates from other strands may also qualify subject to institutional policies and bridging requirements. The curriculum consists of general education courses, core IT professional subjects, internships or practicum experiences, and capstone or research projects intended to integrate theoretical and practical learning.

Based on CHED curriculum standards, the BSIT program aims to develop graduates who are competent in systems analysis and design, software development, networking, database management, cybersecurity, web and mobile application development, and information systems implementation (CHED, 2015). The curriculum likewise emphasizes critical thinking, problem-solving, communication, teamwork, innovation, and professional ethics to prepare graduates for complex technological and organizational environments. These intended learning outcomes are aligned with international computing education frameworks such as the ACM/IEEE Computing Curricula, which emphasize both technical proficiency and industry-relevant competencies necessary for the global digital economy (Association for Computing Machinery [ACM] & IEEE Computer Society, 2020).

Several Philippine higher education institutions offering BSIT programs have also gained national and international recognition for excellence in technology and computing education. Universities such as University of the Philippines, De La Salle University, Ateneo de Manila University, and Mapúa University have consistently appeared in international university rankings, including the QS World University Rankings and Times Higher Education rankings, particularly in computer science, engineering, and technology-related disciplines (QS Quacquarelli Symonds, 2024). These recognitions highlight the increasing importance of maintaining globally competitive IT education in the Philippines. Consequently, continuous evaluation of the BSIT curriculum is necessary to ensure that graduates possess the competencies, adaptability, and ethical foundation required to meet the rapidly evolving demands of the IT industry both locally and internationally.

Research Objectives

This study is guided by the general research question: To what extent are the intended outcomes of the BSIT curriculum achieved and applied by graduates in

their current occupations, and what are their implications for IT education and industry practice? Specifically, the study aimed to: (i) determine the outcomes of BSIT curriculum; (ii) evaluate the extent to which each outcome has been achieved and applied by the BSIT graduates to their present occupation; and (iii) analyse the difference in the performance level of BSIT graduates in their respective occupations.

The significance of this study lies in providing empirical evidence to support curriculum enhancement, instructional improvement, and policy development aimed at strengthening graduate employability and aligning academic preparation with industry demands. It also helps identify competency gaps that may inform continuous improvement of IT education. In addition, the study contributes to the United Nations Sustainable Development Goals (SDGs), particularly SDG 4 (Quality Education) by promoting relevant, competency-based learning, and SDG 8 (Decent Work and Economic Growth) by supporting the development of a skilled and work-ready IT workforce that contributes to innovation, productivity, and sustainable economic development.

Theoretical Framework

This study is anchored on Outcomes-Based Education (OBE) and curriculum alignment theories, which emphasize competency-based learning, student-centered instruction, and graduate employability. *Outcomes-Based Education* is an educational approach that focuses on the achievement of clearly defined learning outcomes, ensuring that students acquire the knowledge, skills, values, and competencies necessary for professional practice and lifelong learning (Spady, 1994). In the Philippine higher education system, OBE serves as the guiding framework for curriculum development and quality assurance, particularly through the policies of the Commission on Higher Education (CHED), which mandate the alignment of program outcomes, teaching methodologies, and assessment practices with industry and societal needs (CHED, 2015). Under this framework, the BSIT curriculum is designed to develop graduates who are competent in systems analysis, software development, networking, database management, cybersecurity, and other industry-relevant technical competencies. The study is likewise grounded in curriculum alignment theory, particularly the principle of constructive alignment proposed by Biggs (1996), which highlights the importance of aligning intended learning outcomes, instructional activities, and assessment methods

to ensure effective learning. Constructive alignment emphasizes that students learn more effectively when curriculum content, teaching strategies, and evaluation processes consistently support the desired competencies and performance standards. In the context of IT education, curriculum alignment is essential in ensuring that academic preparation matches the rapidly evolving expectations of the technology industry and the global workforce. Furthermore, the study is informed by theories of graduate employability, which stress the importance of equipping students with transferable skills, practical competencies, adaptability, problem-solving abilities, and professional ethics necessary for employment and career advancement (Yorke, 2006). As industries increasingly prioritize workforce readiness and practical capability over purely theoretical knowledge, higher education institutions are expected to produce graduates who can effectively apply their learning in real-world professional settings. Thus, the integration of OBE and curriculum alignment theories provides a strong theoretical basis for evaluating the extent to which the BSIT curriculum achieves its intended outcomes and prepares graduates for the demands of the twenty-first-century IT industry.

2 Methods

Research Design

This study was descriptive in nature and its aim was to evaluate the outcomes of BSIT curriculum using survey research design. This type of research used questionnaires to gather information from groups or subjects.

Research Participants

The respondents for this study were IT professors who were teaching under the bachelor's degree program and purposively selected sample of BSIT program graduates in a Public University in the Philippines. They were chosen on the basis of a specified criterion being the products of the BSIT program in a given time period. For the purpose of this study, the BSIT graduates of the Academic Year 2018–2019 were considered. They were considered for they were the first batch of BSIT students who were the products of Outcomes-Based Teaching and Learning (OBTL) BSIT curriculum in the Public University which started in 2015. The total number of respondents depended on the response rate. There were 18 faculty members and a total of 25 program graduates participated in the survey.

The IT professors were described in terms of age, highest educational attainment, and years of teaching experience. Meanwhile, the graduates were profiled according to age, sex, academic performance as measured by general weighted average (GWA), year of graduation, and current occupation. The faculty respondents were predominantly within the 20–50 years age range, representing 18 (100%) of the total faculty participants. In terms of educational attainment, 8 (44%) had earned master's degrees, while 3 (17%) held doctorate degrees. Regarding teaching experience, most faculty members had between 5–20 years of service in higher education.

On the other hand, the graduate respondents consisted of 25 (100%) participants, of whom 21 (84%) were male and 4 (16%) were female. Most graduates were between 21–23 years old. In terms of academic performance, 20 (80%) of the respondents had a general weighted average within the “good” performance category. The majority graduated in 2019, accounting for 13 (52%) of the respondents. In terms of employment, most graduates reported occupations aligned with their degree program, with 15 (60%) working as programmers or as web, mobile, or systems developers.

Instrumentation

The Outcomes of BSIT Curriculum Instrument was designed by the researchers. This was developed after an extensive literature review. This was primarily based on the Philippine Commission on Higher Education (CHED) Memorandum Order (CMO) number 25 series of 2015 regarding the Revised Policies, Standards and Guidelines for BSIT program. This version has become the guide in formulating the outcomes of BSIT program in all Higher Education Institutions (HEIs) in the country. The outcome referred to what is currently being taught through BSIT curriculum. Specifically, this referred to the student learning outcomes which were the specific observable or measurable results that were expected subsequent to a learning experience. These outcomes involved knowledge (cognitive), skills (behavioural), or attitudes (affective) that provided evidence that learning has occurred as a result of the BSIT program. These outcomes were of two types: the Intended Learning Outcomes (ILOs) and the Expected Learning Outcomes (ELOs). The ILOs were based on the BSIT program goals that provided a broad description identifying the foundations, concepts, theories, abstractions, principles, knowledge base, and/or skills, which were the products of what students

are to be able to do, know, and care about upon the completion the program. It covered the recommended and required courses such as the General Education courses and other required events/experiences (e. g., internships, department symposium, advising session.). However, it did not include other specific learning outcomes for major areas or field of specialization under the degree program. The ELOs were the same with that of the intended students learning outcomes. The questionnaire for ELOs helped validate the responses of the faculty members regarding the ILOs and to what extent the graduates were able to achieve those ILOs of the BSIT program.

The study used two types of questionnaires: The first type was for the academic staff (i. e., for determining the ILOs) and the other was for the program graduates (for determining the ELOs). The ILO questionnaire was composed of 70 items which were classified under eight major categories. There was one open-ended question asking the faculty members for other student learning outcome that they know, which was not reflected in the given set of outcomes and was being considered by the Bachelor degree program in Information Technology of the University. This was measured using five-point Likert scale ranging from strongly disagree (5) to strongly agree (1). While the ELO questionnaire with the same set of 70 items, additional one question for an overall assessment and one open-ended question asking the BSIT graduates for other student learning outcome, which was not reflected in the given set of outcomes but was being required of them in their current job as a BSIT graduate of the University. This was measured using a nominal scale no or yes to indicate if the specific outcome was being practiced/ applied by the BSIT graduates and if the answer is yes, they were asked to indicate/ evaluate the level of their performance depending upon how well they achieved and applied each expected outcome to their present job. The level of performance was measured using five-point rating scale ranging from needs improvement (5) to excellent (1). The ELOs were the same with that of the intended students learning outcomes. The questionnaire for ELOs helped validate the responses of the faculty members regarding the ILOs and to what extent the graduates were able to achieve those ILOs of the BSIT program.

Data gathering was done through emails and online survey to the subjects of the study. The instruments undergone face validity where the survey questionnaires were reviewed by two different parties. The first group was consisted of three IT education specialists who were familiar with the learning outcomes of BSIT program. They evaluated the statements and made sure that each statement

successfully captured the research topic and problem. The second review was done by a statistician who ensured that the survey did not contain common errors such as confusing statements. The validation process resulted to slight alteration in the contents of the survey questionnaire. The researcher also run a pilot test of the online survey and reviewed the internal consistency of statements by conducting the test of reliability with a test-retest to a group of 20 students who were not part of the study. The administration of retest was two and a half weeks after the first test. Likewise, the Cronbach-Alpha method was applied, and the result got a total test and retest scores (0.80 and 0.82) with a reliability factor of 'good'.

Confidentiality was addressed by assigning a code number to respondents as they complete the survey and using only that code to indicate survey responses. This code was entered on each survey enabling the researcher to link the survey and the respondent. This link allows the survey results to remain confidential without being anonymous to the researcher.

Data Analysis

The study employed both descriptive and inferential statistical techniques to analyze the survey data in relation to the research questions. Descriptive statistics, including frequencies, percentages, and means, were used to summarize the demographic profile of respondents and to describe the level of achievement and application of BSIT program outcomes among graduates. These measures provided an overall picture of respondents' characteristics and performance indicators in a clear and interpretable form.

For inferential analysis, Spearman's rho correlation was utilized to determine the relationship among the variables, particularly the extent to which program outcomes were achieved and applied in relation to graduates' occupational performance. This non-parametric test was selected due to the ordinal nature of the Likert-scale data and the assumption that the variables may not follow a normal distribution. In addition, the Mann-Whitney U test was employed to examine whether there were significant differences in the achievement and application of program outcomes when grouped according to sex. This test was deemed appropriate as it compares differences between two independent groups without requiring normal distribution assumptions.

All inferential statistical tests were evaluated at a 0.05 level of significance ($p = 0.05$). This means that results with p -values less than or equal to 0.05 were

considered statistically significant, indicating sufficient evidence to reject the null hypothesis.

3 Results and Discussions

Outcomes of BSIT curriculum

Majority of the IT professors strongly believed (Table 1) that the aim (ILO) of BSIT program is to produce graduates who are able to identify and solve computing problems by discussing the best practices and standards; explaining the fundamental principles, concepts, and evolution of computing systems and applying the knowledge of computing, science and mathematics appropriate to IT discipline. This fundamental knowledge helps enable the graduates to analyze problems in IT. Thus, it enables them to design and develop IT solutions with emphasis on the use of modern tools.

Meanwhile, findings from the assessment of program graduates revealed the achievement of the intended vis-à-vis expected student learning outcomes (ELO). This also indicated the success of the BSIT program outcomes in developing their knowledge, attitude, skills and competencies to (i) identify and solve computing problems, (ii) analyze problems in IT, (iii) design/develop IT solutions, (iv) use modern tools, (v) demonstrate individual and team work, (vi) develop the skills and strategies in communicating IT solutions/systems, information or argument to a range of audiences for a range of purposes, (vii) practice computing professionalism and social responsibility, and (viii) demonstrate interest in lifelong learning.

Program Learning Outcomes	Mean Rank	
	ILO	ELO
Identify and solve computing problems.	1.11	1.89
Analyse problems in IT.	1.28	1.72
Design/Develop IT solutions.	1.28	1.72
Use modern tools	1.28	1.72
Demonstrate individual and team work.	1.19	1.81
Develop the skills and strategies in communicating IT solutions/systems, information or argument to a range of audiences for a range of purposes.	1.33	1.67
Practice computing professionalism and social responsibility.	1.22	1.78
Demonstrate interest in lifelong learning.	1.25	1.75

Table 1 Outcomes of BSIT Curriculum

Performance of BSIT graduates vis-a-vis the achievement of program outcomes

The program graduates confirmed the application of all the indicated outcomes to their respective occupations. Table 2 presents the top 25 expected student learning outcomes of BSIT program, which were based on the order of overall weighted mean from highest to lowest value. The data showed that most of the program outcomes were excellently performed and practiced by the BSIT program graduates in their present jobs.

Findings showed that most of the program outcomes applied in the actual practices of the IT professions were directly related to designing and developing IT solutions, using modern tools and somehow communicating proposed IT solutions and systems to a range of audiences. This is particularly true given that majority of the respondents were programmers. This affirms the importance of hard/technical skills and soft skills as a customer-oriented communicative tool in their future employment (Patacsil & Tablatin, 2017; Succi & Canovi, 2020; Szilárd et al., 2018).

Expected Student Learning Outcomes	Mean
1. Be able to perform existing software evaluation in terms of usability through evaluation of heuristics, performance and user preference metrics (i. e. learnability, task timing, completion of tasks and client satisfaction).	1.68
2. Be able to design, implement and evaluate as to how computer-based systems, as well as their components or sub-modules, meet client needs and requirements given various constraints and business rules.	1.68
3. Be able to program, debug and test script codes with distinctive familiarity with management of an operating system platform.	1.72
4. Be able to substantially discuss the issues in the utilization of information technology in terms of professional, ethical, legal, security and societal concerns.	1.72
5. Be able to discuss the management of enterprise information systems in terms of legal and ethical considerations.	1.76
6. Be able to provide evaluation and interpretation of performance results of IT solutions according to set evaluation criteria.	1.76
7. Be able to design, develop and test software that uses an asynchronous messaging service through the network.	1.78
8. Be able to develop applications via different platforms like the web, mobile and emerging technologies with emphasis on the different software engineering methodologies such as in defining requirements, designing interfaces, evaluating usability, software testing, and implementation in a manner that will be harmonious with ethical and considerations.	1.78
9. Be able to effectively implement the proposed IT solution.	1.78
10. Be able to recommend enhancements in the IT solution which has implementation concerns.	1.80

Expected Student Learning Outcomes	Mean
11. Be able to apply IT professional knowledge on current techniques, skills, tools and practices.	1.80
12. Be able to utilize a structured coding, documentation and licensing standard onto complex software project in which reliability, efficiency and robustness are considered alongside legal and ethical concerns.	1.84
13. Be able to formulate objectives, scope, limitations and evaluation mechanisms for an IT project.	1.84
14. Be able to analyse the impact of IT computing systems locally and globally on individuals, organizations and society.	1.84
15. Be able to analyse the ethics and legal issues that may arise in information technology filed and consequently determine the means to ethically and technically address the issues.	1.84
16. Be able to explain rudimentary principles, concepts, and evolution of computing concepts as to how they relate to other fields.	1.88
17. Be able to propose improvements in algorithms as may be needed on data warehousing and data mining.	1.88
18. Be able to recommend the use of a more appropriate programming and/or scripting language and, provide ample explanation in support of the recommended language.	1.88
19. Be able to design, code, test and debug event-driven programs with functionalities that correspond to user events.	1.90
20. Be able to design, test, debug and implement software that solve computing problems using basic data structures and supporting standard libraries.	1.90
21. Be able to provide an ethical and feasible IT solution proposal to the identified problems in the project.	2.00
22. Be able to effectively work as a member or leader of a software development team and to be able to recognize the various roles of people within the team towards the accomplishment of a common goal.	2.20
23. Be able to harmoniously and progressively work in a team that analyses, designs, implements, tests, and/or documents a software system in an organizational environment.	2.20
24. Be able to effectively communicate to the computing community and society through writing, presentations and clear instructions as to how a complex computing system works.	2.22
25. Be aware of and engage in planning, self-learning and performance improvement as necessary for continuous professional development.	2.29

Range: 1.00–1.80 – Excellent; 1.81–2.60 – Very Satisfactory; 2.61–3.40 – Satisfactory; 3.41–4.20 – Fair; 4.21–5.00 – Needs Improvement

Table 2 Performance of BSIT graduates vis-a-vis the achievement of program outcomes

However, outcomes related to identification and providing solution for computing problems, analysis of problems in IT, practice of computing professionalism and social responsibility, demonstration of individual and team work as well as interest in lifelong learning indicated low achievement and performance among BSIT program graduates. Truly, soft skills are equally important as technical skills especially for the company or industry that are involved in providing customer services. Common soft skills related to jobs in the fields of business and computer

technology were communications, critical and decision-making, interpersonal, negotiation, problem solving, self-confidence, self-management, teamwork and worth ethics (Bringula et al., 2016; Williams, 2015;). Academic qualifications are essential, but the aptitudes and attitudes of graduates are equally, if not more, important to employers. These include motivation, an ability to think “outside the box” and an ability to work both as part of a team and independently. Other frequently cited attributes include trainability, presentation skills, positive attitudes, accountability, ambition, discipline, and civic skills (Mamino-Bayot & Cruz, 2025; Sumaya & Ortega-Dela Cruz, 2024). Several studies have pointed out that the rise of service industries and the use of information technology have made such softer skills more important in entry-level jobs (Malykhin et al., 2021; Pai & Mayya, 2022; Suarta et al., 2017). Therefore, IT graduates must be trained concerning this aspect for their future employment requirement. Higher educational institutions must understand and embrace twenty-first century skills within the context of rigorous labour market standards. Higher education should focus on preparing students to solve complex problems by reinforcing new ways of thinking and acquiring new kinds of knowledge. In this regard, students should be able to evaluate knowledge critically and develop the ability to reflect on what they are doing and why (Nagarajan & Edwards, 2015). This critical, inventive thinking, and digital literacy aside from collaboration and communication abilities are some of the significant twenty-first century skills that are required in their current and future workplace (Van Laar et al., 2019) particularly in the field of IT.

Test of relationships (Table 2) among variables revealed a moderate positive correlation between the respondents’ general average and their perceived level of achievement and performance ($r_s(25) = 0.34, p = 0.09$) as well as their age and performance ($r_s(25) = 0.35, p = 0.08$). Nevertheless, the result is not statistically significant. This also indicates that the result is particularly true to the sample of 25 respondents and is not generalizable to other IT graduates in other State Universities and Colleges (SUCs) in the country.

Correlations		Age	GWA	Sex	
Spearman's rho	ELO	Correlation			
	Performance	Coefficient	.348	.345	.198
		Sig. (2-tailed)	.089	.091	.342
		n	25	25	25

Table 3 Test of association among variables

Moreover, statistical analysis revealed no difference among the respondents' perceived achievement and performance of the expected student learning outcomes of BSIT program (Mann-Whitney $U = (25) = 37.5$, $p = 0.33$). This means that the perceived achievement and actual performance is the same with all the respondents of the study regardless of whether they are male or female. Likewise, the result is not statistically significant.

4 Conclusions

This study examined the outcomes of the Bachelor of Science in Information Technology (BSIT) curriculum implemented in one public university in the country, providing empirical evidence on the extent to which specific program outcomes have been achieved and applied by graduates in their current employment. The findings indicate that most identified program outcomes have been favorably attained and practiced by graduates; however, several outcomes require greater emphasis to ensure a more holistic and responsive IT education.

At the same time, the findings must be interpreted with caution. The comparison of perspectives across respondents is constrained by the limited sample size and institutional scope, and the results are therefore not statistically generalizable. Rather, the study is exploratory and context-specific, offering analytically transferable insights that may inform similar institutions but cannot be assumed to represent all BSIT programs. In addition, the dataset reflects a pre-AI educational and labor market context, and there is a time gap between data collection and publication. Given the rapid transformation of IT practice and education following the widespread adoption of artificial intelligence and large language models after 2023, the results should be viewed as a baseline reference point rather than a definitive assessment of current curriculum effectiveness.

Despite these limitations, the study highlights the critical role of higher education institutions in preparing IT graduates for an increasingly dynamic workplace. Employers continue to emphasize graduates' ability to apply knowledge, adapt to evolving environments, and demonstrate transferable competencies over purely theoretical mastery.

These findings point to important areas where the BSIT curriculum can be strengthened to better bridge the gap between educational outcomes and workplace expectations and to support the development of twenty-first-century IT professionals.

In particular, the BSIT curriculum should provide holistic academic experiences by enabling graduates to learn how to learn through flexible, learner-centered pedagogies that foster autonomy, adaptability, and continuous self-directed learning. Simulated or real-world projects, role-playing activities, teamwork, and problem-solving tasks can effectively support this goal. The curriculum should also adopt deep learning approaches that promote self-development and lifelong learning, ensuring graduates remain relevant in rapidly changing technological contexts. Furthermore, aligning teaching, learning, and assessment through constructive alignment (Biggs, 2016; Cruz, 2020) can enhance outcomes-based education by shifting the focus from instructor-centered delivery to student-centered learning activities.

Beyond technical competencies, BSIT programs must emphasize the development of management, social, and cultural skills essential for global employability. Career management, self-management, communication, collaboration, and intercultural competence can be strengthened through work-integrated learning, reflective practice, peer review, internships, and participation in professional and student organizations (Bridgstock, 2009; Ortega & Cruz, 2016; Dela Cruz & Dela Cruz, 2020). Such approaches contribute to the formation of well-rounded graduates who are open to diverse career pathways within and beyond discipline-specific IT roles.

The technology-driven nature of contemporary society places increasing demands on higher education institutions to ensure that their curricula remain relevant, flexible, and future-oriented. A dynamic twenty-first-century BSIT curriculum must cultivate higher-order competencies such as problem-solving, critical and creative thinking, metacognition, communication, collaboration, innovation, and entrepreneurial thinking, while reaffirming the importance of foundational academic knowledge and digital literacy.

Building on the present findings, future research is essential to extend and update the evidence base. Comparative studies examining pre-AI and post-AI graduate cohorts, particularly those graduating after 2023, are needed to assess how curriculum outcomes, skill application, and employability have evolved in response to AI-driven transformations. Larger, multi-institutional studies involving both public and private higher education institutions would enhance the robustness and transferability of findings. The adoption of mixed-methods and longitudinal research designs could further illuminate how graduates' competencies and career trajectories develop over time in increasingly AI-augmented work environments.

Future research should also incorporate the perspectives of employers, industry partners, and academic staff to triangulate graduate outcomes and to evaluate curriculum innovations such as AI-integrated modules, micro-credentials, and flexible or hybrid learning models.

By grounding curriculum reform in empirical evidence and continuous research, higher education institutions can more effectively prepare IT graduates with the knowledge, skills, values, and adaptability required for sustainable and inclusive technological development. In doing so, BSIT programs can contribute meaningfully to the formation of competent, resilient, and future-ready IT professionals capable of meeting the evolving demands of the twenty-first century.

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