Information Technology Education: It's Role towards Sustainable National Development

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途上国において持続的な経済成長を可能にし、貧困を解消するにはITの活用が不可欠で、そのためには実務的なIT教育の充実が求められる。本稿ではフィリピンの大学での聞き取り調査をもとにIT教育の課題を探った。

Abstract

This study used survey research design to explore the purposes and outcomes of Bachelor of Science in Information Technology (BSIT) degree program in the Philippines. Using purposive sampling of professors and students, this study identified the ability of the IT education to meet its purposes by way of validating its current outcomes. The study also provides clear indication of how the outcomes were perceived differently based on how the respondents experienced the actual IT education curriculum. Though the results show some favourable agreements among the respondents, statistical findings reveal underlying issues related to the implementation of outcomes-based IT education system in the country. This calls for the active role of HEIs offering BSIT programs to take another more careful look on the entire curriculum structure of the degree program as it serves as the foundation of an effective and efficient IT education that will lead towards sustainable national development of the country.

Keywords information technology, higher education, purposes, outcomes, national development

Introduction

Information Technology plays a vital role in advancing economic growth and reducing poverty of a country. It is being utilized to support development efforts in the developing world. In fact, IT and other technologies have the potential to enhance the prospects of various developments in any third world nation such as in education, agriculture, economics, social infrastructure and in other issues that can alleviate the poor condition of man (Papaioannou & Dimelis,2007). Thus, this makes IT education a significant factor to national development for countries across the globe.

However, no one can deny the fact that the field of IT is ever dynamic. Its rapid and continuous advancement and development had resulted to a serious challenge in the field of IT education. Specially, when the kind of training and skills developed do not match with what are needed by the IT industries.

In the Philippines, as early as in 1993, the Educational Commission (EDCOM) of the Senate of the Philippines reported a mismatch between the products of educational system and the needs of the labour market which leads to slow economic performance (Santiago-Arquiza, 2017). Besides, several studies recognize this slow economic performance to other quality indicators such as inadequate skills and global competencies of the workforce and unemployability of graduates in the global environment (Pastrana and Manabat, 2014).

Understanding the roles that Higher Educational Institutions (HEIs), employers, graduates and professional associations could play in the professional preparation of new graduates for work can help the alignment of these expectations. Since the HEIs have a crucial role in this process, the academic staff ought to find ways on how to address this issue on labour mismatch. Likewise making them realize how they affect the way students

should be prepared for their productive and contributing roles in the country's IT industries towards sustainable national development.

By studying the perceptions of IT education professionals, this study identifies what purposes of IT education curriculum are considered significant. The study also identifies the current outcomes of these purposes in an effort to identify influences that affect both purposes and current outcomes of IT education curriculum given that the Philippine IT education system is in a state of transition.

The Bachelor of Science in Information Technology (BSIT) is a four-year degree program in the Philippines that deals with the processing and distribution of data with emphasis on its application on businesses. It is the study of utilization of computers and computer software to plan, install, customize, operate, manage, administer and maintain information technology infrastructure. The BSIT program prepares students to be IT professionals, be well versed on application installation, operation, development, maintenance and administration, and familiar with hardware installation, operation, and maintenance.

HEIs in the Philippines offering BSIT program have adopted an outcomes-based education framework in developing an IT education curriculum. Implementation of this new approach is in response to the country's critical issue on mismatch between the products of educational system and the needs of the labour market.

Outcomes-Based Education (OBE) is an approach to education as well as a type of learning process wherein decisions about the curriculum are driven by the exit learning outcomes that the students should display at the end of the course (Borsoto et.al. 2014 in Dela Cruz & Ortega-Dela Cruz, 2017; Ortega & Ortega-Dela Cruz, 2016). It is a term used to imply that everything will be designed and organized around the intended outcomes, which a learner needs to demonstrate at the end of the learning program (Ortega & Ortega-Dela Cruz, 2016 in Dela Cruz & Ortega-Dela Cruz, 2017). On this account, the BSIT curriculum is designed to reflect the country's needs for graduates that are well prepared to enter the workforce and to assume their place of responsibility in the nation. The goal of the IT education is to produce graduates having strong technology and communication skills as well as a good understanding of business practices and work ethics. The purpose of the OBE approach is to provide students a focused and coherent academic program that will enhance the skills and competencies required by the economy and the market. Thus, it prepares the graduate students for a rapidly changing and unpredictable future.

Generally, this study seeks to determine the perceptions of IT education professionals regarding the purposes and current outcomes of the revised BSIT OBE curriculum. Specifically, this study aims to: (i) determine the perceptions of IT education professionals regarding the purposes of BSIT curriculum; (ii) determine the perceptions of IT education professionals and students regarding the outcomes of BSIT curriculum; and (iii) analyse the difference in the perceptions of IT education professionals and students regarding the intended and expected learning outcomes of BSIT curriculum.

Materials and Methods

This study is descriptive in nature and it seeks to determine the perceptions of IT education professionals as well as the students regarding the purposes and current outcomes of BSIT curriculum using survey methods. This type of research uses questionnaires and interviews to gather information from groups or subjects.

The respondents for this study were IT education professionals or those who were teaching under the bachelor degree program and purposive sampling of graduating students taking BSIT in a Public University in the Philippines. There were 18 faculty members and 50 randomly selected students or 66 per cent of the entire graduating students in the College of Computer Studies.

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. The questionnaire has two types: The first type is for the academic staff and the other is for the students. It assesses their perceptions of regarding the outcomes of BSIT curriculum. This contains several items which were measured using a five point Likert scale ranging from strongly disagree (5) to strongly agree (1). The student questionnaire helped validate the responses of the IT education professionals if what they teach are the ones they are supposed to teach to their students.

The library research deals with gathering pertinent data about the bachelor degree program in information technology including the: (i) description, (ii) admission requirements, (iii) content, (iv) resources, (v) instruction/evaluation methods, (vi) graduation requirements/ employment requirements, as well as the (vii) practical training of the students.

The instruments were validated by specialists in the field who were not part of the subject of the study. The validation process resulted to slight alteration in the contents of the survey questionnaire.

Confidentiality was addressed by assigning a code number to each respondent 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.

The study employs descriptive statistics such as frequencies, percentages, and means to provide descriptive analysis of the survey; and standard deviations to determine the difference between the mean perceptions of the professionals and students on the outcomes of IT education.

To further validate the outcomes, the Kendall's W or Coefficient of Concordance was used to assess the agreement in the responses among respondents. The Kendall's W or Coefficient of Concordance for each item ranges from 0 to 1. A Kendall's W yield of zero indicates no agreement at all among raters, while 1 indicates perfect agreement (Legendre, 2010). And to test if there are significant differences among outcomes, the non-parametric method Kruskal–Wallis test by ranks or Kruskal–Wallis H test or one-way ANOVA on ranks was applied.

Results and Discussion

Profile of the major subject of the study

IT professors were described in terms of their age, highest educational attainments as well as number of years in teaching. Whereas, the students were characterized based on their age, sex, and self-assessment of academic performance in terms of grade point average. The age of the faculty members ranged from 20-50 years old which constituted 94 per cent of the total number of respondents. A total of 18 respondents participated in filling out the survey questionnaire. Forty-four per cent of the professors have earned their master's degrees. While 17 per cent of them have their doctorate degrees. Most of them have been into teaching from five to 20 years in the service.

On the other hand, there were 50 students who participated in answering the self-administered questionnaires, 66 per cent male and 34 per cent female. Majority of these students were in between 20 to 24 years of age. In terms of college academic performance, 60 per cent of the respondents' grade point average fall on two. This means that most BSIT students have an average or satisfactory performance in their degree program.

The following sections present the detailed discussion of the findings based on the objectives of the study.

Objective no. 1 of the study deals with the perceptions of IT education professionals regarding the purposes of IT education.

Table 1 presents the perceptions of the faculty members on the goals of IT education in the Philippines. The result of Kendall's W coefficient of concordance reveals evidence of weak agreement among IT education professionals as to the ranking of purposes of BSIT program (Kendall's W (df=4, n=18) = 0.17, p= 0.01). The respondents agreed most favourably on the BSIT program goals that have to do with educating the students in the basic principles and utilization of both hardware and software technologies involving planning, installing, customizing, operating, managing and administering, and maintaining information technology infrastructure

that provides computing solutions to address the needs of an organization (A), preparing the graduates to address various user needs involving the selection, development, application, integration and management of computing technologies within an organization (B), assisting the students in developing knowledge, attitude, skills, and competencies for productive careers as employees, employers and candidates for graduate studies who are capable of contributing to the country's national development goals (C). Examples include ethics, the critical (i.e., research skill) and. It helps develop the students' ethical decision making and problem-solving skills, their critical or their research skills, as well as their sense of professionalism. Furthermore, the program aims to prepare graduates to become globally competent, innovative, and socially and ethically responsible computing professionals engaged in life-long learning endeavours.

However, the IT professors agreed least favourably on the purposes that deal with fostering industry partnerships (regional and/or national) to offer experiential learning opportunities to students and a pathway for productive careers in the IT industry (E), developing the students' knowledge of a discipline, their communication, leadership, planning and management skills, also their entrepreneurial and marketing skills, and their sense of social responsibility.

In the Philippines, IT education is built upon a core of courses and a series of professional courses leading to one or more of the three programs. The New General

Table 1. Purposes of IT Education

Program Learning Goals	*f*	%	Mean Rank
A. Educate students in the basic principles and utilization of both hardware and software technologies involving planning, installing, customizing, operating, managing and administering, and maintaining information technology infrastructure that provides computing solutions to address the needs of an organization.	14	78	8.69
B. Prepare graduates to address various user needs involving the selection, development, application, integration and management of computing technologies within an organization.	14	78	9.22
C. Assist students in developing knowledge, attitude, skills, and competencies for productive careers as employees, employers and candidates for graduate studies who are capable of contributing to the country's national development goals. Examples include but not limited to:	13	72	8.69
1. ethics	14	78	8.72
2. the critical (i.e., research skill) and creative thinking skills that are necessary for fostering innovation	13	72	9.22
3. basic decision-making and problem-solving	12	67	9.78
4. professionalism	12	67	9.81
5. negotiation and facilitation skills	11	61	10.3
6. respect for social and cultural differences	11	61	10.3
7. social, interpersonal and team building skills	11	61	10.3
8. technical and vocational skills in computing	11	61	10.3
9. business, income-generating and entrepreneurial skills	10	56	12.4
10. lifelong learning skills	10	56	10.9
11. knowledge of a discipline, that is, scientific understanding of theoretical and practical aspects of computing	9	50	11.4
12. leadership, planning and management skills	9	50	11.4
13. communication skills (oral and written including cross- cultural	8	44	12.0
14. social responsibility	8	44	12.3
15. marketing skills	7	39	12.6
D. Prepare graduates to become globally competent, innovative, and socially and ethically responsible computing professionals engaged in life-long learning endeavours.	11	61	10.3
E. Foster industry partnerships (regional and/or national) to offer experiential learning opportunities to students and a pathway for productive careers in the IT industry.	9	50	11.4

Education Curriculum as mandated by the Commission forms part of the requirements for IT education. The required natural science courses in the General Education curriculum include a laboratory component. The curriculum outline is divided into five components namely: General Education, Basic IT education Core z electives and free electives with a minimum requirement of 140 units. The outline is as follows: Language and Humanities 24 units; Mathematics, Natural Science and Technology 15 units; Social Sciences and Communication 15 units; Basic IT education Core Courses 18 units; IT Professional Courses 33 units; IT Electives 12 units; Free Electives 9 units; PE and NSTP 14 units; 140 units Thesis and Capstone projects are required as a scholarly work of scientific approach with contents and concepts focused on computing. These studies may be presented in public forum. Internship is also required of all majors. It is an immersion program wherein the student will have the opportunity to be in the IT industry. This program is important because the students will have the chance to apply the skills, knowledge and attitude learned in the school and at the same time the opportunity to experience the corporate environment.

Learning expectations in the IT related field should be established between the HEI and the industry in the form of a Memorandum of Agreement (MOA) or Memorandum of Understanding (MOU). Internship is a requirement. Students are eligible to enrol in the internship program after completing the 80 per cent of the total number of units in the curriculum. The minimum number of internship hours are 286 (see complete details on CMO #53 at www.ched.gov.ph/policies/index.html). This indicates how the curriculum of BSIT program corresponds with its major goal in preparing graduates for the tasks they are going to perform on their jobs. The kind of education and training in preparation for their future employment after graduation.

Objective no. 2 of the study covers the perceptions of IT education professionals and students regarding the outcomes of BSIT program. These outcomes are of two types: the *Intended Student Learning Outcomes (ILO)* and the *Expected Student Learning Outcomes (ELO)*. Both are composed of 8 major items and 69 sub-items, a total of 70 items in all. Several items are provided which are also measured using five point Likert scale ranging from strongly disagree (5) to strongly agree (1).

The following tables present the top 20 outcomes of IT education. Quantified data were shown in a manner corresponding to the order of overall frequencies from the highest to lowest value/s of the strongly agree (1) scale. This serves as the point of reference in the analysis and interpretation.

Table 2 shows the intended student learning outcomes BSIT curriculum based on the perceptions of IT education professionals. Majority of the IT professors strongly believed that the IT education aims to produce graduates who are able to identify and solve computing problems by discussing the best practices, standards (A_1); explaining the fundamental principles, concepts, and evolution of computing systems (A_2) and applying the knowledge of computing, science and mathematics appropriate to IT discipline (A_{10}). This fundamental knowledge helps enable them to analyse problems in IT (B_3, B_4). Thus, enables them to design and develop IT solutions (C_5, C_6, C_7, C_8, C_{14}, and C_{21}) with emphasis on the use of modern tools (D_2, D_3, D_5, and D_{10}). However, the result reveals no significant agreement among IT education professionals as to the ranking of perceived ILOs of BSIT program (Kendall's W (df=7, n=18) = 0.07, p= 0.28).

Table 3 presents the expected student learning outcomes of BSIT curriculum based on the perceptions of IT students. Of all the 69 sub-items, the students strongly believed that their academic experiences and activities in their BSIT program developed their knowledge, attitude, skills and competencies in being able to identify and solve computing problems by analysing the different user populations (A_5) and the appropriateness of a decision to in-source or out-source IT services in a given situation (A_6), applying the knowledge of computing, science and mathematics appropriate to IT discipline (A_{10}) as well as recommending appropriate operating systems based on given system requirements (A_{13} and A_{14}). This fundamental knowledge helps enable them to analyse problems in IT (B_1). Thus, enables them to

Table 2. Intended Learning Outcomes of IT Education

Student Learning Outcomes	*f*	%
B4. Design a database based on user requirements using a widely used modelling notation	15	83
A1. Discuss the best practices, standards and their applications.	14	78
A10. Apply knowledge of computing, science and mathematics appropriate to IT discipline.	14	78
D3. Apply knowledge through the use of current techniques, skills, tools and practices necessary for the IT profession.	13	72
A2. Explain fundamental principles, concepts, and evolution of computing systems as they relate to different fields.	12	67
B3. Use appropriate mathematical tools for decision making.	12	67
C21. Implement the proposed IT Solution.	12	67
D2. Analyse routing algorithms protocols, process routing tables and configure routers for proper orientation of an efficient network.	12	67
D5. Develop specifications for a software development effort that precisely articulates the functional requirements, expected execution paths, and the explicit use of cutting edge or emerging technologies which include hardware devices and software library.	12	67
E2. Assist in the creation of an effective IT project plan.	12	67
G1. Discuss professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology.	12	67
G2. Discuss the legal and ethical considerations related to the handling and management of enterprise information assets.	12	67
A9. Evaluate the design of existing user interfaces based on the cognitive models of target user.	11	61
C5. Design, implement, test, and debug programs intended to solve computing problems using fundamental programming constructs.	11	61
C6. Design, implement, test, and debug programs intended to solve computing problems using basic data structures and standard libraries.	11	61
C7. Design, develop and test a program that uses a messaging service that sends asynchronous messages across the network.	11	61
C8. Design, develop and test a program that uses SAX or DOM to parse an XML document, XSL and XSLT to transform a data stream from one format to another.	11	61
C14. Deploy and serve media contents within web applications.	11	61
D10. Implement an enterprise integration middleware platform.	11	61
F1. Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions.	11	61

design and develop IT solutions (C_2, C_5, C_6, C_7, C_8, C_{14}, and C_{16}) that are to be communicated to a range of audiences (F_1, F_2, and F_5). Moreover, the result reveals no significant agreement among the students as to the ranking of perceived ELOs of BSIT program (Kendall's W (df=7, n=50) = 0.04, p= 0.07).

Statistical findings show a significant difference in the perceptions of the students regarding their overall assessment of the BSIT program in its goal on addressing the demands of the labour market (x^2(3, n=50) = 32.400_a, p<.01). About 42 percent of them strongly agreed, 48 per cent agreed, while the remaining 10 per cent were either uncertain or disagreed with the program goal attainment.

Coefficient of Concordance reveals congruence in the perceptions of IT education professionals and students regarding the intended and expected learning outcomes of BSIT curriculum. Table 4 affirms the extent of the ability of BSIT program to meet the purposes that have been set forth. That is, if what the professors teach under the BSIT program (i.e., expected outcomes) is what they are supposed to teach and develop in their students (i.e., intended outcomes). Basically, the statistical findings show a *strong agreement* between the perceived ILO and ELOs relative to the knowledge and understanding of computing problems (A) (Kendall's

Table 3. Expected Learning Outcomes of IT Education

Student Learning Outcomes	*f*	%
C5. Design, implement, test, and debug programs intended to solve computing problems using fundamental programming constructs.	24	48
A6. Analyse the appropriateness of a decision to in-source or out-source IT services in a given situation.	18	36
G1. Discuss professional, ethical, legal, security and social issues and responsibilities in the utilization of information technology.	18	36
A10. Apply knowledge of computing, science and mathematics appropriate to IT discipline.	17	34
C7. Design, develop and test a program that uses a messaging service that sends asynchronous messages across the network.	17	34
C14. Deploy and serve media contents within web applications.	17	34
E1. Function effectively as a member or leader of a development team recognizing the different roles within a team to accomplish a common goal.	17	34
F5. Write a simple assembly-language program.	17	34
A5.Analyze different user populations with regard to their abilities and characteristics for using both software and hardware products.	16	32
C16. Construct an architectural model of a complex system using an architectural framework.	16	32
D10. Implement an enterprise integration middleware platform.	16	32
F2. Demonstrate comprehensive knowledge of the area of study and research methods used.	16	32
B4. Design a database based on user requirements using a widely used modelling notation	15	30
C2. Integrate IT-based solutions into the user environment effectively.	15	30
C6. Design, implement, test, and debug programs intended to solve computing problems using basic data structures and standard libraries.	15	30
C8. Design, develop and test a program that uses SAX or DOM to parse an XML document, XSL and XSLT to transform a data stream from one format to another.	15	30
F1. Communicate effectively with the computing community and with society at large about complex computing activities through logical writing, presentations, and clear instructions.	15	30
G3. Analyse the local and global impact of computing information technology on individuals, organizations, and society.	15	30
A13. Recommend an appropriate operating system based on given system requirements.	14	28
A14. Recommend where an application language and a scripting language would be more appropriate and give a valid reason to support the selection.	14	28

W=0.60), while *moderate agreement* on the outcomes relative to the development of skills on individual and team work (E) (Kendall's W=0.45), computing professionalism and social responsibility (G) (Kendall's W=0.35), and lifelong learning (H) (Kendall's W=0.41).

Albeit most of the identified outcomes of the professors are being met by the students, the findings also reveal that significant outcomes relative to the development of higher order thinking skills and competencies were not given much emphasis on the BSIT program. Indicatively, these outcomes reveal *weak agreement* among the respondents. These include problem analysis (B) (Kendall's W=0.19), design/development of solutions (C) (Kendall's W=0.19), modern tool usage (D) (Kendall's W=0.19), and communication (F) (Kendall's W=0.11). This is also reflected in the overall ranking of the outcomes. The findings are mostly statistically significant.

This finding is being validated by the results of the Kruskal Wallis H Test or One-Way ANOVA on Ranks which reveal significant difference among the perception rating of the respondents on the major outcomes of IT education specifically in terms of developing the skills on problem analysis (H (1, n=68)=9.39, p=0.00) and communication (H (1, n=68)=7.29, p= 0.01), competencies on the development of solutions (H (1, n=68)=8.14, p=0.00), and the use of modern tools (H (1, n=68)= 9.99, p= 0.00). On the other hand, analysis of variance on the outcomes relative to developing the knowledge for solving computing problems (H (1,

Table 4. Summary of ILOs and ELOs of IT Education

Student Learning Outcomes	Kendall's W	Mean Rank		p-value
		ILO	ELO	
A. Identify and solve computing problems.	0.60	1.11	1.89	0.00
B. Analyse problems in IT.	0.20	1.28	1.72	0.06
C. Design/Develop IT solutions.	0.20	1.28	1.72	0.06
D. Use modern tools	0.20	1.28	1.72	0.06
E. Demonstrate individual and team work.	0.45	1.19	1.81	0.00
F. Develop the skills and strategies in communicating IT solutions/systems, information or argument to a range of audiences for a range of purposes.	0.11	1.33	1.67	0.15
G. Practice computing professionalism and social responsibility.	0.35	1.22	1.78	0.01
H. Demonstrate interest in lifelong learning.	0.41	1.25	1.75	0.01

Kendall's W level of agreement: 0.00 No; 0.10-Weak; 0.30-Moderate; 0.60-Strong; 1.00-Perfect

Table 5. Kruskal-Wallis Test on Outcomes of IT Education

	Test Statistics[a,b]							
	A	B	C	D	E	F	G	H
Chi-Square	14.5	9.39	8.14	9.99	6.24	7.29	7.13	6.29
df	1	1	1	1	1	1	1	1
Asymp. Sig.	.000	.002	.004	.002	.012	.007	.008	.012

n=68)=14.5, p=0.00), the attitude towards individual and team work (H (1, n=68)=6.24, p= 0.01), computing professionalism and social responsibility (H (1, n=68)=7.13, p=0.01) and lifelong learning (H (1, n=68)=6.29, p=0.01) did not match with the findings on the coefficient of concordance. This indicates that the perception rating of the ILO via-a-vis ELO is not the same in all outcomes of the BSIT program among respondents of the study.

Truly, academic qualifications such as having knowledge and skills are essential, but the aptitudes and attitudes of graduates are equally, if not more, important to industries or potential employers. These "++ factors according to Tan and French-Arnold (2012) include problem solving and communication skills, and the ability to work both as part of a team and independently (UNESCO, 2012). It is also vital that IT graduates liable to work in many different jobs and industries throughout their entire career seek to constantly improve and update their skill, and willing to learn new technologies. This is where the relevance of lifelong learning skills development comes in. Students therefore have a responsibility to prepare themselves for a changing world by improving their knowledge and skills to meet the demands of employers and the realities of the workplace and IT education plays a crucial role in its fulfilment.

Conclusion

The study elucidates the purposes and outcomes of IT education. The study also provides clear indication of how the outcomes, in particular the ILOs, were perceived differently by the professors and the students in the case of ELOs based on how they experienced the actual IT education curriculum. Though the results show some favourable agreements among the respondents, statistical findings cannot veil the fact that there are also underlying issues related to the implementation of outcomes-based IT education system in the country. This calls for the active role of HEIs offering BSIT programs to take another more careful look on the entire curriculum structure of the degree program as it serves as the foundation of an effective and efficient IT education.

One of the strengths of the Philippine IT industry is the size and quality of its IT manpower base. However, due to the pace of technological advancements,

continuous ongoing curriculum development in IT education and training are necessary to maintain the country's competitive advantage when it comes to a number of training facilities for computer programming and computer related courses.

IT offers renewed opportunities for developing countries like the Philippines, which can shift from exploitation of natural resources at the expense of the environment, to tapping its human resources. It empowers people, expands the reach of government and improves governance, transforms business organizations while reconfiguring business relationships, and integrates economies seamlessly.

These opportunities and many other benefits of IT on the economic and social development heighten the importance of IT education in a country. IT education purposes and outcomes need to be attuned with each other, may it be based on the perspectives of the implementers (i.e., educators) and end users (i.e., educands) in order for the country to benefit most out of its outputs. IT is a highly technical profession, and the fact that it demands highly technical manpower does not mean that that the purposes and outcomes it sets forth no longer adhere to values formation and soft skills development, which are equally important to fully utilize its capacity and purpose. It is therefore crucial for BSIT program to help its graduates cultivate qualities that are indispensable not only for IT industries but for inclusive economic growth that will lead to sustainable development of the entire nation.

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