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Attaining the Program Educational Objectives of the IT Program Three to Five Years After Graduation: An Evidence-Based Approach

Arlene Mae Celestial-VALDERAMA[a*], Roel C. TRABALLO[ab], Sharmaine Justyne R. MAGLAPUZ & Don Erick J. BONUS[a]
[a]*Jose Rizal University, Philippines*
[b]*University of Makati, Philippines*
*arlene.valderama@jru.edu

Abstract: Faculty and administrators responsible for setting academic standards, such as institutional outcome (IO), program educational objectives (PEO), student outcomes (SO) and course learning outcomes (CLO) are internal key stakeholders in universities, especially when aligning with national and international competencies. This paper presents an evidence-based attainment of these objectives. The focal point of this study is on the Bachelor of Science in Information Technology (BSIT) program of the university. It addresses the research question of how program educational objectives are attained for the BSIT degree towards results on each identified PEO where the target point is to attain them 3 to 5 years after their graduation at the university. Quantitative descriptive analysis was employed, and 52 alumni from their graduation year between 2013-2018 were identified respondents of the study under the aforementioned degree program. A PEO-inclined tracer survey with first indicators states that 71% of the respondents' current jobs are in line with their college degree (PEO 1). 48% have rated that they have impacted "very much" contribution in the IT field given their current line of work (PEO 2). Lastly, 42% rated that they have "very much" involvement level in research and development projects in the IT field and allied disciplines (PEO 3). The results have stated positive and the majority of indicators of the attainment of the three PEOs identified by the IT department under the College of Computer Studies and Engineering.

Keywords: program educational objectives, BSIT program, evidence-based objectives attainment, IT graduates

1. Introduction

School administrators, stakeholders, and the teaching sector have been constantly selecting identifiable visions for respective higher education institutions (HEIs). These items aligning to the vision and mission include institutional outcomes, degree program educational objectives, student outcomes, and course learning outcomes. In order to produce graduates of social importance, they wished these outcomes would be attained on the appropriate timeline, including those based on national and international competencies, as they are crucial to the internal stakeholders in universities (Shenderova, 2022). Monitoring and attainment of defined objectives and outcomes is tedious but must adhere to its conformities and attainment.

1.1 Program Educational Objectives Quality

The university has maintained certification for ISO 9001:2015 for the past 9 years, it has conducted internal quality and external audits to the current version of the globally recognized standard for Quality Management Systems (QMS). The last recent school year 2024-2025, it

has applied and passed the ISO 21001:2018 Educational Organization Management System (EOMS) emphasizing importance for maintaining the institution's certification and enhancing the quality management system within the educational organization. In line with the attainment of the program education objectives, the review of these goals is maintained in accordance with the HEI's ISO document coded as ACM 4.2 Curriculum Development, Review and Validation for Higher Education, where ACM is for the Academic Affairs Manual.

In the context of Jose Rizal University, an Institutional Outcome is defined along with Vision and Mission. Following this is the identification of Program Education Objectives (PEO) for each program offering. Tshai et. al. (2014) stated that broad statements outlining the professional and career achievements that the program is preparing the graduates to attain should be included in PEOs. The next salience on this path is how can the university design curriculum and programs that effectively prepare graduates for their desired careers? More so, how can these be measured? For Aldowaisan & Allahverdi (2015), it is important that performance metrics and target attainment levels are established as part of an evaluation procedure used for every PEO. As the university identifies at least three Program Educational Objectives for the degrees, these objectives must match an attainment through a well-designed curriculum. This paper presents an evidence-based attainment of these objectives. The focus is on the Bachelor of Science in Information Technology program of the university. There are 3 identified PEOs and 13 Student Outcomes (SO), cross-matched with each course in the curriculum with at least 3 Course Learning Outcomes (CLO). As this paper focuses on the 3 PEOs of the BSIT program, it focuses mainly on the data of BSIT graduates. The process of monitoring alumni's locus and acquiring information about graduates' job performance from employers is time-consuming and labor-intensive. Universities conduct tracer studies to monitor graduates and evaluate the effectiveness of their education in preparing them for their careers. For accreditation purposes, the findings are also used to evaluate the caliber of programs in higher education (Dewi, et. al., 2021). To streamline this process, the university Guidance and Testing Office, Alumni Office, and the College of Computer Studies and Engineering have conducted a graduate tracer initiative via a survey form floated online and was distributed to alumni from Batches 2013-2018 via the creation of an online graduate tracer approach, taking advantage of internet and mobile technologies.

The ability of college graduates to enter the job market serves as a critical indicator of learning outcomes and the alignment of higher education with societal needs. This paper focuses on the research question of how Program Educational Objectives are attained for the BSIT degree towards results on each identified PEO. The Program Educational Objectives (PEO) of the BSIT program in Jose Rizal University includes:

Three to five years after completing the BS Information Technology, the graduates will:

1) *"Excel in their profession/career utilizing the knowledge acquired in the Information Technology courses."*
2) *"Become effective collaborators and innovators in information technology, applying professional/technical skills and competencies to make a positive impact on society;" and*
3) *"Be engaged in life-long learning and professional development through self-study, continuing education, or graduate and professional studies."*

Higher education institutions have a shared responsibility, two of which are: to impart necessary competencies to their graduates and to facilitate their transition into employment. In order to attain these objectives three to five years after graduation, the university has been implementing the achievement of thirteen Student Outcomes (SO) throughout the four-year stay of the BSIT student in the institution. A way to achieve this is the inclination of at least three course learning outcomes of every course the student takes each semester.

2. Methods and Analysis

2.1 Profile

An alumni tracer documentation data was floated through Survey monkey, retrieved August 2024. It is composed of 32 questions that were distributed to alumni of the BSIT program. The

tracer questions were subjected to a validation process for face and content validity. It was defined by McBurney (1995) as the following:

- Face validity is the idea that a test should appear superficially to test what it is supposed to test; and
- Content validity is the notion that a test should sample the range of behavior represented by the theoretical concept being tested.

In the validation process, content validity was used. The 32-item questionnaire followed in this study was formulated by six (6) experts of the alumni tracer project study of the HEI. Mentioned experts were composed of the alumni director, college coordinator for alumni, dean of the college, and 3 department chairs of the college. Five (5) of the experts excluding the alumni director have formulated and tapped the questions as essential with the intention of measuring the relevance of the objectives of the study. Following the formula in calculating the content validity ratio (CVR) (Taylor, 2017), the questionnaire's worth is based on the ratings of the experts. The equation is for Content Validity Ratio using the formula: CVR = [E - (N / 2)) / (N / 2)], where: E is number of experts who rated the questionnaire as essential, N is total number of experts. The CVR is 0.67 which is an acceptable result. Respondents age range is 20-35, (n = 52; 14 females and 38 males). Their graduation year starts from 2013-2018. A distribution of the graduation year is exhibited in Table 1.

Table 1. *Year of Graduation Distribution*

Year of Graduation	Number	Distribution	3 Years After Graduation	4 Years After Graduation	5 Years After Graduation
2013	4	8%	2016	2017	2018
2014	13	25%	2017	2018	2019
2015	10	19%	2018	2019	2020
2016	7	13%	2019	2020	2021
2017	10	19%	2020	2021	2022
2018	8	15%	2021	2022	2023
Total	**52**	**100%**			

As Table 1 presents the alumni data from the aforementioned years of graduation, it is salient to note that PEO 1 has measurable results of BSIT degree holders' data must be 3 to 5 years after their graduation. Venturing on the 3-year mark, the graduates allowable present information ranges from 2017-2022. For the 4-year mark, information ranges from 2017-2022, and lastly for the 5-year mark, it ranges from 2018-2023.

2.2 Employability

Pheko & Molefhe (2016) proposed a structured approach for various players in the labor market to ensure the advancement of attributes as well as skills in employability skills. In their study, fostering employability is a collaborative effort involving training providers, employers, existing employees, and potential employees. A study gap that may be addressed in this paper is the experience of the higher education institution (HEI) in a decline of the relevance of the BSIT graduate competencies towards their past and present employment. The study of Segbenya, et. al. (2023) acknowledged four key areas of skills ensuring employability, it includes intellectual or scholarly skills, personality dispositions, meta-skills and those that focus on the job itself. Research on employability now encompasses all forms of employment, not only unemployment. Government agencies, higher education institutions (HEIs), and businesses must all work together to promote skills associated with employability of graduates (Tasker & Packham, 1994). As JRU identifies the attainment of the course learning outcomes, the diversity of skills may be attained through them as it crossmatches alongside the student outcomes. In today's competitive global job market, universities must prioritize their graduates'

employability. This is key for graduates to secure satisfying careers and for employers to stay ahead of the competition (Su & Chang, 2015).

Out of 52 respondents, only 1 replied of non-employment, all other 51 alumnus are currently employed on the date of survey data extraction. Jose Rizal University has been monitoring employment among its graduates; the alumni respondents have been employed after graduation in their jobs within the following time range. In less than 6 months after graduation, 83% or 43 out of 52 of the alumni have been employed. Within 6 months to 1 year, 15% or 8 out of 52 were employed. Lastly, between 1 to 2 years, 2% or only 1 of 52 have been employed. Among these, their employment varies with local and foreign employment. Data shows that 8% are from foreign employment, 90% are locally employed, and 2% are self-employed. Another factor worth noting is the number of employments the alum has occupied since obtaining their college degree. There are 38% who mentioned that they only had 1 job since college, 31% had 2, 25% had 3, and only 6% said that they already had more than 3. To conclude, this paper also states how long the alumni have stayed in their present employer. 37% of them have been on their present employment in less than 6 months. 29% have stayed for 1 to 2 years already. 13% have been working for 6 months to 1 year. 10% have been employed within 2 to 3 years, and lastly also 10% have been working for more than 3 years in their companies.

3. Results and Discussion

3.1 Program Educational Objectives

The nature of the company the alumni are engaged in at present includes 42% in services and consultancy, 4% in commercial and retail, 2% in education, and 52% have mentioned others but clearly all have stated their technical positions in their jobs. These job titles include programmers, database administrators, information security specialists, quality assurance specialists, systems analysts, technical support specialists, and web and application developers.

The BSIT graduates were asked to assess the applicability of their JRU curriculum to their current professional endeavors. They rated the relevance of their obtained JRU curriculum in college to their current line of work. Table 2 shows a summary.

Table 2. *Rating of Curriculum Relevance to Current Employment*

Rate (10-highest)	# of Responses	Distribution
10	5	10%
9	4	8%
8	13	25%
7	8	15%
6	6	12%
5	9	17%
4	1	2%
3	3	6%
2	2	4%
1	1	2%
Total	**52**	**100%**

The most common rating was 8 out of 10, with 25% of respondents choosing this option. It suggests that the respondents found their curriculum relevance to their current employment has its rating to be very good, but not perfect. In the context of a survey or assessment, it might mean that the respondents believe that their BSIT program is highly effective and useful.

In terms of satisfaction with the quality of education they have received, 46 of them have replied positively, which comprises a high 88% and only 6 or 12% have stated otherwise.

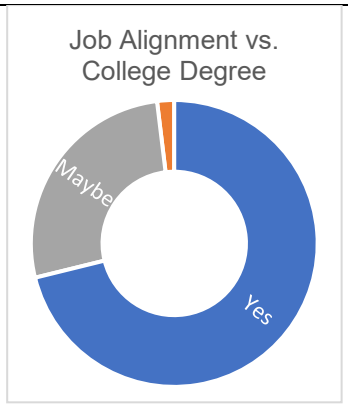
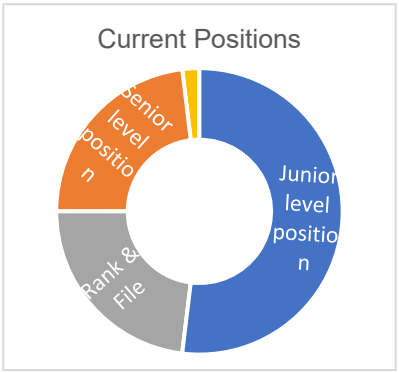
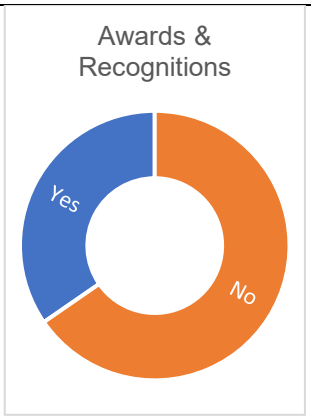
3.1.1 Program Educational Objective 1

The university has defined PEO #1 as “Excel in their profession/career utilizing the knowledge acquired in the Information Technology courses.”

Historically, a “career” was often seen as a linear progression, with individuals moving from one job to another in a way that led to higher positions and status within an organization (Ojala et. al., 2021). In accordance with the BSIT first program educational objective, graduates were given the opportunity to assess the congruence of their jobs’ alignment with their degree. Seventy-one percent of respondents affirmed the statement, while 2% negated it. Twenty-seven percent expressed uncertainty.

For their present positions, more than half of them are in junior level positions or 52%. There are 23% who are in senior level positions and rank and file, respectively. And 2% are in a top management position. A considerable number of graduates have been honored and acknowledged for their contributions to the field of information technology and allied disciplines. Thirty-five percent of the graduates have attained such recognition. To further illustrate, Table 3 presents a summary of the charts.

Table 3. *PEO 1 Indicators*

PEO 1 Indicator 1	PEO 1 Indicator 2	PEO 1 Indicator 3
		

3.1.2 Program Educational Objective 2

The university has defined PEO #2 as “Become effective collaborators and innovators in information technology, applying professional/technical skills and competencies to make a positive impact on society.”

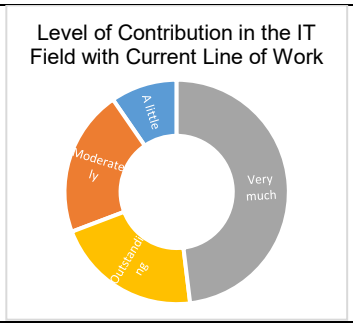
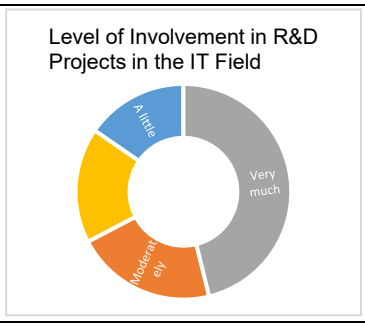
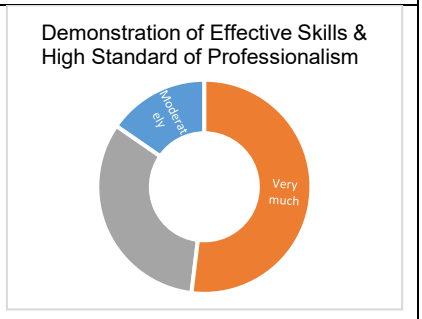
The graduates were also given the opportunity to rate the level of their contributions in the field of Information Technology. This clearly states that they are assessing the impact and significance of their work in that area as well. Essentially, this is how the BSIT degree holders are evaluating how valuable their contributions have been to the advancement of Information Technology. The highest remark of “Outstanding” was responded to by 21% of the graduates. About 48% of the graduates have expressed that they have contributed “very much”, 21% have mentioned that they contributed “moderately”, and only 10% have responded that they have “little” contributions.

Involvement in research and development (R&D) projects in Information Technology means active participation in projects that aim to create new or improved IT products, services, or processes. These respondents were also able to contribute to these. About 17% of the respondents have been outstandingly involved. A high proportion of respondents with 46% have been inclined to research and development “very much” as the second top box score. 15% have been “moderately” inclined and only 15% have been involved “a little.”

For this second PEO to take effect, the graduates were also asked if they have ever highlighted their ability to use technology effectively and maintain a prominent level of

professionalism in their work. It is good to note that more than half of them have responded to the second top box score, “very much” which is a massive 52%. A high of 33% also have positively replied to the perfect top box score of “outstanding.” And only 15% have replied “moderate” showcase abilities. No one has responded only “a little” ability in the utilization of technology effectiveness. To further illustrate, table 4 presents a summary of the charts.

Table 4. *PEO 2 Indicators*

PEO 2 Indicator 1	PEO 2 Indicator 2	PEO 2 Indicator 3
		

3.1.3 Program Educational Objective 3

The university has defined PEO #3 as “Be engaged in life-long learning and professional development through self-study, continuing education, or graduate and professional studies.”

The respondents have received several training opportunities and advancement in their professional development. They have obtained these in their current line of work. To demonstrate evidence of this, they have rated the level of training received that enabled them to achieve continuous education and professional advancement. Second top box score of “very much” has gained the highest responses of 42%, top box score of “outstanding” has gained 27%. The “moderate” level of training has 29% and only 2% gained “a little” level of training in professional education advancement. Figure 1 presents a summary of this indicator.

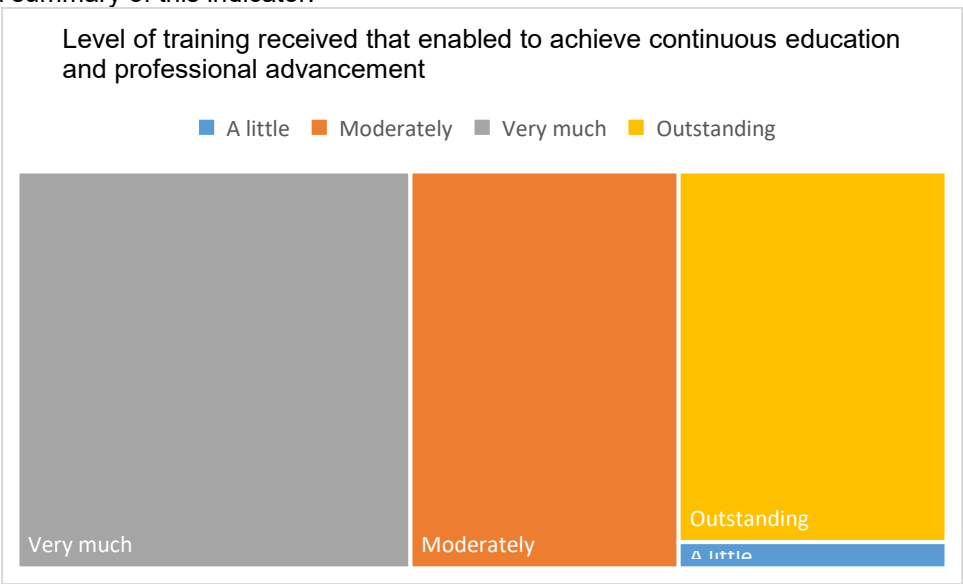


Figure 1. *PEO 3 Indicator 1*

In reference to their professional education, there are 5 alumni who have pursued professional education. This data includes 2 technical training courses and 3 graduate studies. These comprise of DevOps/B2B Expertise/AWS SysOps and Cisco training for technical inclination. The graduate programs pursued included MBA, MIT, and LLB.

Certifications relevant to the Information Technology field and allied disciplines are formal qualifications that validate an individual's knowledge and skills in specific areas of IT.

Recognized professional organizations or technology vendors typically award these certifications. 12 respondents receive these certifications:

1) Data Privacy
2) CRM Training Certification and Security Network Certification
3) Certification for IBM B2B Integration Technical Mastery, Certification for IBM Managed File Transfer Mastery
4) Technical certification for Lenovo, HP, Asus, and Epson Services
5) Drupal Apprentice Program
6) Google Analytics, HubSpot Certified
7) Robotics
8) Cisco training completions
9) Salesforce Certifications: Salesforce Certified Administrator & Salesforce Certified Platform App Builder
10) Software Developer – JAVA
11) Programming- TESDA
12) Training certificate for Java, Cobol, HTML, CSS3, BOOTSTRAP, JavaScript, and Network Management

4. Conclusion

Bhele (2020) provides insights into how specific academic initiatives can boost student and graduate employability, offering measurable metrics for assessing their effectiveness. Their framework addresses the challenges higher education institutions face in influencing employability outcomes. By examining their case studies, it demonstrated how variations in the labor market can significantly impact employability rates. Ultimately, a comprehensive understanding of employability requires a multifaceted approach that considers a range of indicators, including labor market factors, to present a more nuanced picture. Pham et. al. (2024) They suggested that measuring graduate employability immediately after graduation is insufficient, as different forms of capital impact career development at various stages.

An online tracer survey for the Jose Rizal University for the Bachelor of Science in Information Technology program is in place. As of present time, the Alumni Office of the university has central control and management of these data, and every college of the Academic Division has their share of providing data. These initiatives are in place to trace data on graduates and to assess the educational program objectives (PEO) of the degree programs offered by the university.

The results of the responses in this documentation have stated very good indicators of the attainment of the three PEOs identified by the IT department under the College of Computer Studies and Engineering. The usefulness and usability of the college education system are well-indicated by the tracer study. To ensure its accessibility, the system should be designed to serve both current and former graduates. In this predicament, the academic council can immediately obtain graduate statistics and user feedback.

References

Shenderova, S. (2022). Collaborative degree programmes in internationalisation policies: the salience of internal university stakeholders. European Journal of Higher Education, 13(2), 197–215. https://doi.org/10.1080/21568235.2022.2120035

Tshai, K. Y., Ho, J. H., Yap, E. H., & Ng, H. K. (2014). Outcome-based Education – The Assessment of Programme Educational Objectives for an Engineering Undergraduate Degree. Engineering Education, 9(1), 74–85. https://doi.org/10.11120/ened.2014.00020

Aldowaisan, T., & Allahverdi, A. (2015). Improving educational objectives of the Industrial and Management Systems Engineering programme at Kuwait University. European Journal of Engineering Education, 41(3), 252–262. https://doi.org/10.1080/03043797.2015.1056100

Dewi, N. R., et al. (2021). J. Phys.: Conf. Ser. 1918 042010

McBurney, Donald H. (1995). The Problem Method of Teaching Research Methods. First Published February 1, 1995. Accessed from https://repository.up.ac.za/bitstream/handle/2263/28684/03chapter3.pdf?sequence=4

Taylor, C. (2017). How to Calculate Content Validity Ratios. Updated September 26, 2017, https://bizfluent.com/how-7448484-calculate-content-validity-ratios.html

Pheko, M. M., & Molefhe, K. (2016). Addressing employability challenges: a framework for improving the employability of graduates in Botswana. International Journal of Adolescence and Youth, 22(4), 455–469. https://doi.org/10.1080/02673843.2016.1234401

Segbenya, M., Oppong, N. Y., Nyarko, E. A., & Baafi-Frimpong, S. A. (2023). Demographic characteristics and employability skills among tertiary graduates in Ghana: Evidence from the National Service Scheme. Cogent Economics & Finance, 11(2), Accessed from https://doi.org/10.1080/23322039.2023.2225915

Tasker, M., & Packham, D. (1994). Government, higher education, and the industrial ethic. Higher Education Quarterly, 48, 182–193.10.1111/hequ.1994.48.issue-3

Su, W., & Zhang, M. (2015). An integrative model for measuring graduates' employability skills—A study in China. Cogent Business & Management, 2(1). https://doi.org/10.1080/23311975.2015.1060729

Ojala, K., Isopahkala-Bouret, U., & Varhelahti, M. (2021). Adult graduates' employability and mid-career trajectories after graduation with Finnish UAS Master's degree. Journal of Education and Work, 34(1), 67–80. https://doi.org/10.1080/13639080.2021.1875125

Behle, H. (2020). Students' and graduates' employability. A framework to classify and measure employability gain. Policy Reviews in Higher Education, 4(1), 105–130. https://doi.org/10.1080/23322969.2020.1712662

Pham, T., Soltani, B., & Singh, J. K. N. (2024). Employability capitals as essential resources for employment obtainment and career sustainability of international graduates. Journal of Further and Higher Education, 48(4), 436–448. https://doi.org/10.1080/0309877X.2024.2344771