Graduate's employability: A tracer study of the UB School of Engineering and Architecture from S.Y. 2012 to 2016

Engr. Jeferd E. Saong[1], Engr. Edgardo Javier[2] and Engr. Ariel Moyaen[2]

[1] Dean, School of Engineering and Architecture
  University of Baguio, Baguio City, Philippines
  Email: iamjeferdsaong@gmail.com

[2] Faculty, School of Engineering and Architecture
  University of Baguio, Baguio City, Philippines

Abstract

The Commission on Higher Education (CHED) mandated the conduct of a tracer study for higher educational institutions to measure quality and determine the ability of graduates to work in their fields. The study aimed to make an employment profile of School of Engineering and Architecture graduates from 2012 to 2016. The result of the study can be used as a basis for developing the curriculum and making the competencies of the graduates more relevant to workplaces. A descriptive-survey design was used to profile the alignment of the graduate's program to their employment. Percentages and frequency counts summarized the data gathered from 155 respondents. A higher response rate was observed from the graduates of the BSECE program compared to the other programs. The majority of the respondents were employed in work related to their program and in loca private companies. A total enumeration of graduates in the tracer study can help strengthen the capability of graduates to be competitive in their field of specialization. The low response rate of the graduates to the tracer study necessitates an improvement in the

social media strategy to reach the SEA graduates by including personal communications through an alumni coordinator to improve the respondents' response rate.

Keywords: graduate employability, engineering, architecture, tracer study

Introduction

The existence of Higher Education Institution (HEI) contributes to the improvement of higher-level competencies and skills of graduates for long-term employability. Employers want graduates who can adapt to the workplace and participate in innovative teamwork. The Commission of Higher Education (CHED) requires HEIs to submit a report on the employability of its graduates through a tracer study.

The employability of an individual is often associated with their skills, theoretical foundations, and personal attributes, which together make them competitive in the workplace. HEIs are expected to equip graduates with the said features of employability (Kalufya & Mwakajinga, 2016). The effectiveness of HEIs is determined by the quality of graduates who are enabled to work in their respective fields (Celis, Fetijo, & Cueto, 2013). Indeed, the employability of graduates is one of the measures used to gauge the quality of education fostered by HEIs (Alusen, 2016).

To maintain a competitive status, HEIs must develop the employability skills of graduates in order to respond to the needs of the industry and expectations from enrollees (Theron, 2014). Academic institutions must generate graduates capable of applying technology to their work environment (Dotong, Chavez, Camello, & De Castro. 2016) and ensure that graduates are well-equipped for work. Employability pertains to the capability to gain employment, remain employed, and obtain new employment when necessary.

Higher educational institutions (HEIs) strive to help students in improving skills for employability (Lees, 2002) to address the competitive requirements of the industry. For example, HEIs must develop skills considered necessary in the workplace, such as computing and research (Al-Mutairi, Naser, & Saeid, 2014). Tomlinson (2012) stressed that graduate employability is influenced by the dynamic relationship between the higher education institution and the industry. Dynamic changes in industry requirements affect the potential career of graduates. Thus, HEIs must coordinate with industries to reshape its programs for the transition of graduates in the workplace.

In response to the outcomes-based curriculum requirement of CHED memorandum order no. 37 series of 2012, there is a need to examine its curriculum offering relative to the industry. There is a need to strengthen the competencies that could make the curricular offering more relevant to current jobs (Ramirez, 2014). This tracer study was conducted to assess the UB-SEA programs through the graduates' responses serving as feedback in improving the curriculum.

The study aimed to assess the employability of graduates and accomplishments of UB-SEA programs; Bachelor of Science in Architecture, Bachelor of Science in Civil Engineering, Bachelor of Science in Electronics Engineering, Bachelor of Science in Environmental and Sanitary Engineering, and Bachelor of Science in Industrial Technology – Major in Mechatronics in the period 2012-2016. The study seeks to profile the respondents of the tracer study using the following factors:
  a. Program completed
  b. Year of graduation
  c. Employment status
  d. Alignment of work to the completed program
  e. Classification of workplace

Methodology

The authors used a descriptive research design to make a profile of the respondents. A survey questionnaire consisting of the graduates' profile, current employment and position, classification of workplace, and work experience was lifted from the institutional survey questionnaire created by the Research and Development Center. A convenience sampling was done to seek participants using UB's website and social media accounts where the questionnaire were posted. The graduates were invited to participate in the study through the post by answering the questionnaires. The authors also personally distributed the questionnaires to the graduates on campus.

A total of 155 graduates responded to the survey, including 20 BSARCH, 50 BSCE, 32 BSECE, 21 BSESE, and 32 BSIT-Mechatronics graduates from batches or school years 2012 to 2016. The data were processed for interpretation using frequency counts and percentages. The results of the study will be published in the University of Baguio Research Journal and disseminated further through research colloquia.

Results and Discussion

The University of Baguio School of Engineering and Architecture offers five programs, namely, Bachelor of Science in Architecture (BSARCH), Bachelor of Science in Civil Engineering (BSCE), Bachelor of Science in Electronics Engineering (BSEE), Bachelor of Science in Environmental and Sanitary Engineering (BSESE), and Bachelor of Science in Industrial Technology-Major in Mechatronics. Table 1 presents respondents' programs and years of graduation.

As shown in Table 1, the BSCE program had the most number of graduates ($n = 173$), while the BSECE had the least ($n = 61$). The 2016 graduation had the most number of graduates ($n=140$), while 2013 the lowest (n=75). Out of all the programs, BSCE had the highest number of graduates. The

result is similar to the data of Penedilla and Rosaldo's (2017) study which indicated that Civil Engineering was one of the preferred courses of STEM senior high school students.

Table 1

Profile of graduates

PROGRAM	2012-2016 Graduates						2012-2016 Respondents					
	2012	2013	2014	2015	2016	TOTAL	2012	2013	2014	2015	2016	TOTAL
BSARCH	14	12	20	9	14	69	4	1	8	4	3	20
BSCE	30	17	29	35	62	173	4	3	4	14	25	50
BSECE	14	9	20	7	11	61	11	4	8	1	8	32
BSESE	5	12	7	18	26	68	2	0	1	9	9	21
BSIT	38	25	33	16	28	140	11	3	7	6	7	32
TOTAL	101	75	109	85	140	511	32	11	28	34	52	155

Table 2 shows the graduates' response rate per program. As shown, the BSECE program had the highest overall response rate at 53%, while the BSIT had the lowest response rate at 24%. Moreover, the BSIT graduates' response is consistently below the total graduates' response rates from 2012 to 2016. Also, the overall BSCE and BSARCH graduates' response, 29%, and 29%, respectively, were below the overall graduates' response of 31%. The response rate for graduates changes every year. In 2012, BSECE had the highest response rate at 79%, while the BSCE was lowest at 13%. It was below the total response rate of 32%. In 2013, the lowest total response rate at 14.66% was recorded, with BSECE at 44% while the BSESE did not register a response from any of the graduates. Looking at the data for BSARCH, BSECE, and BSIT from 2014 to 2016,

Table 2

Graduates' Response rate per program

PROGRAM	Graduates Response, %					
	2012	2013	2014	2015	2016	TOTAL
BSARCH	28.57	8.33	40.00	44.44	21.42	28.98
BSCE	13.33	17.64	13.79	40.00	40.32	28.90
BSECE	78.57	44.44	40.00	14.28	72.72	52.45
BSESE	40.00	0.00	14.28	50.00	34.61	30.88
BSIT	28.94	12.00	21.21	37.50	25.00	24.28
TOTAL	**31.68**	**14.66**	**25.68**	**40.00**	**36.87**	**30.72**

the graduates' responses can be attributed to the changes in the recorded -contact information of the University and the inactivity of the graduates i-n social media. Some alumni transaction requests with the office through representatives who were given alumni survey forms may not have been recorded. The forms, albeit accomplished, may not have been returned to the office after the completion of transactions. The response rate of graduates to the tracer study is opposite of the findings of Pontillas (2018), who almost had total enumeration. However, it was similar to the findings of Hazaymeh and Dela Peña who also found varying rates of graduate response in different programs. These findings imply that the distribution of the tracer study questionnaire to the graduates should be enhanced to improve participation in future tracer studies.

Table 3 shows the respondents' employment status. As presented, the majority of the respondents were employed (142), while 13 of them were not. On the contrary, only one graduate in 2012 was not employed; all respondents of 2013 graduates were employed. From 2014 to 2016, there was an increase in the graduates' unemployment rate.

Table 3

Employment status

PROGRAM	Employed Graduates, n(%)						Not Employed, n(%)					
	2012	2013	2014	2015	2016	Sub-total	2012	2013	2014	2015	2016	Sub-total
BSARCH (N=20)	4 (20.00)	1 (5.00)	6 (30.00)	3 (15.00)	2 (10.00)	16 (80.00)	0 (0.00)	0 (0.00)	2 (10.00)	1 (5.00)	1 (5.00)	4 (20.00)
BSCE (N=50)	4 (8.00)	3 (6.00)	4 (8.00)	14 (28.00)	23 (46.00)	48 (96.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	2 (4.00)	2 (4.00)
BSECE (N=32)	10 (31.25)	4 (12.50)	8 (25.00)	1 (3.12)	7 (21.87)	30 (93.75)	1 (3.12)	0 (0.00)	0 (0.00)	0 (0.00)	1 (3.12)	2 (6.25)
BSESE (N=21)	2 (9.52)	0 (0.00)	1 (7.76)	6 (28.57)	8 (38.09)	17 (80.95)	0 (0.00)	0 (0.00)	0 (0.00)	3 (14.28)	1 (4.76)	4 (19.04)
BSIT (N=32)	10 (31.25)	2 (6.25)	6 (18.75)	6 (18.75)	7 (21.87)	31 (96.88)	0 (0.00)	0 (0.00)	1 (3.12)	0 (0.00)	0 (0.00)	1 (3.13)
TOTAL (N=155)	30 (19.35)	10 (6.45)	25 (16.12)	30 (19.35)	47 (30.32)	142 (91.61)	1 (0.64)	0 (0.00)	3 (1.93)	4 (2.58)	5 (3.22)	13 (8.39)

The BSCE program has the highest rate of employability with only two unemployed graduates out of the 50 respondents. The BSCE program is the most popular engineering program as it is one of the oldest engineering disciplines that applies to the continuous infrastructure projects in public spaces. The BSCE program aligns with the build-build-build program of the current administration. The demand for infrastructures increases the employment opportunities of engineering graduates. The employment profile of the respondents is similar to the findings of Lucañas' (2014) study where data indicated that most of the respondents were employed. The studies of Hazaymeh and Dela Peña (2014) and Chavez, Camello, Dotong, and Pamplona (2017) stressed that engineering graduates are highly employable and enjoy the benefits of regular status while handling technical positions immediately after graduation. This implies that the graduates of the School of Engineering and Architecture have a high percentage of employment.

Table 4 shows the profile of employed respondents with work related to the completed program.

Table 4

Respondents with work-related to the completed program

PROGRAM	Related Position/Work, n(%)					Not Related Position/Work, n(%)				
	2012	2013	2014	2015	2016	2012	2013	2014	2015	2016
BSARCH (N=16)	3 (18.75)	1 (6.25)	6 (37.50)	3 (18.75)	2 (12.50)	1 (6.25)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
BSCE (N=48)	4 (8.33)	3 (6.25)	4 (8.33)	14 (29.16)	23 (47.91)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
BSECE N=30	10 (33.33)	4 (13.33)	8 (26.66)	1 (3.33)	7 (23.33)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
BSESE (N=17)	2 (11.76)	0 (0.00)	1 (5.88)	6 (35.29)	8 (47.05)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
BSIT (N=31)	10 (32.25)	2 (6.45)	6 (19.35)	6 (19.35)	7 (22.58)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)	0 (0.00)
TOTAL (N=142)	**29 (20.42)**	**10 (7.04)**	**25 (17.60)**	**30 (21.12)**	**47 (33.09)**	**1 (0.70)**	**0 (0.00)**	**0 (0.00)**	**0 (0.00)**	**0 (0.00)**

As shown in Table 4, only one of the 142 respondents is employed in a workplace that is not related to the graduated program. The employment data on the Schools' graduates is similar to Laguador and Dotong's (2013) stud where majority of graduates were employed with course-related positions. This implies that engineering and architecture graduates are usually qualified for their field of specialization.

Respondents for the year 2016 had the most related work or position aligned to the graduated program. In the BSARCH program, the related work or position of the respondents includes a) five designers at an Architectural industry, b) eight proprietors in an Architectural firm, c) one school Architect, and d) one planning officer, while the non-related work is one construction worker. In the BSCE program, the related work or position of the respondents includes a) six quantity surveyors, b) one quality control engineer, c) 14 engineer positions, d) seven project engineers, e) five site engineers, f) one technical facilitator, g) two engineering assistants, h) one safety officer, i) nine proprietors in a Civil Engineering firm, j) one quality assurance engineer, and k) one construction manager. In the BSECE program, the related work or position of the respondents includes a) one project analyst, b) three proprietors in an Electronics Engineering firm, c) two software engineers, d) two network engineers, e) two site engineers, f) two information technology specialist, g) four assembly and test, h) two process engineers, i) 4 product engineers, j) one evaluation engineer, and k) two maintenance engineers. In the BSESE program, the related work or position of the respondents includes a) 10 engineer positions, b) one quantity surveyor, c) two project managers, d) three environmental specialists, and e) one sanitation specialist. In the BSIT program, the related work or position of the respondents includes a) 20 technicians, b) two human resource training personnel, c) one quality control officer, d) one health and safety officer, e) one factory worker, f) two proprietors of a technology firm, g) one sales executive, h) one site engineer, and i) one account analyst.

Table 5 shows the workplace classification of the respondents in the local and international sectors.

Table 5

Classification of Workplace

Program	Local		International	
	Public n (%)	Private n (%)	Public n (%)	Private n (%)
BSARCH (N = 16)	5 (31.25)	8 (50.00)	0 (0.00)	3 (18.75)
BSCE (N = 48)	20 (41.66)	22 (45.83)	0 (0.00)	6 (12.50)
BSECE (N = 30)	3 (10.00)	18 (60.00)	3 (10.00)	6 (20.00)
BSESE (N = 17)	5 (29.41)	8(47.05)	0(0.00)	4 (23.52)
BSIT-Mechatronics (N = 31)	6 (19.35)	16 (51.61)	2 (6.45)	7 (22.58)
TOTAL (N = 142)	**39 (27.46)**	**72 (50.70)**	**5 (3.52)**	**26 (18.30)**

Most of the respondents were employed in a local workplace. The employment data support the findings of Buama (2018) that graduates prefer to work and render service locally. Engineering graduates are highly employable locally where they can enjoy a regular employment status. The acceptance of the graduates to a full-time work encourages them to stay in local employment (Chavez, Camello, Dotong, & Pamplona, 2017). The majority of the respondents were employed in a private companies whether in the local (72) and international (26) setting due to the availability and increase of private agencies. The BSECE program had the highest percentage (60%) in private employment and lowest percentage (10%) in public employment such as in local companies; the preference of the graduates is opposite the findings of Buama (2018) where most of the graduates are engaged in the government sector. The diversity of job positions allows engineering and architecture graduates to be employed in positions relevant to the program. The local employment of the graduates aligns with the Philippine Development Plan (PDP) 2017-2022, which calls for accelerating infrastructure development to support the country's socio-economic development.

Conclusions and Recommendation

The SEA graduates have a high rate of employment in their field of specialization in local private agencies.

The graduates of the BSECE program and SEA graduates of the last two years were had higher participation rates in the tracer study compared to the earlier batches. The low response rate of the graduates to the tracer study necessitates an improvement in the social media strategy to reach the SEA graduates. For instance, tracer studies can include personal communication through an alumni coordinator to improve the response of the graduates.

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