Tracer Study of Bs in Mathematics Graduates (2001 – 2015) of the College of Science, University of Eastern Philippines

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Abstract

To find the locations of the Bachelor of Science in Mathematics graduates from the College of Science at the University of Eastern Philippines, a descriptive study was carried out. The employability of graduates from the first class of 2001 through 2015 was assessed by the study. It identified the graduates who are working, whether or not it is relevant to their course of study; it also identified the kinds of positions they have, the skills they have acquired, and the salary they make. The majority of responders work for a living. The majority of them work in the Philippines under contracts. Of the 110 graduates, 91 are in employment; for the remaining 19, no information was obtained. Most of them are professionals who teach at the secondary and university levels. The best use for problem-solving abilities is in one's personal and professional development. The most highly regarded factor in the degree students completed at the College of Science was their interaction with their teachers.

Keywords: BS in mathematics graduates; job readiness; career counsellor.

Introduction

An approach called "traitor study" is commonly employed by most organisations, particularly those in the educational sector, to monitor and maintain records on their graduates. Assessing a person's development up until the point at which they land a job is its goal. This survey evaluated the quantity and calibre of graduates. It is designed to respond to changes in business and industry by fusing the goals of postsecondary education institutions with those of the labour market. Since they can offer useful data for assessing the outcomes of higher education and training institutions, it is a crucial tool for educational planners. This data can be utilised to minimise any potential shortcomings in the content, delivery, and relevance of a particular educational programme as well as to advance the institution's development within the framework of quality assurance. Every institution will gain the most from the tracer study since it would enable them to know the whereabouts of their products once they graduate.

Harald Schomburg defines a tracer study as an investigation into the graduates of a higher education institution. Other names for it include "Follow-up Study," "Graduate Career Tracking," "Alumni Researches," and "Graduate Surveys." This study evaluates the availability and quality of graduates rather than merely the duration of study, the amount of time needed to write the thesis, the GPA, and the amount of time it takes to land the first job. The field in which the graduates work, their first remuneration, and—most importantly—the opinion of stakeholders regarding the graduates are all tracked as quality indicators. Additionally, it tracks the most common competencies employed by graduates in the workplace, which might be useful for evaluating higher education (e.g., curriculum development). "Benchmarking according the needs of the universities – not rankings" [1] is the study's main phrase.

One type of empirical research that can suitably offer useful data for assessing the outcomes of the instruction and training of a particular higher education institution is the graduate tracer study. It has the capacity to gather vital data about graduates' employment profiles, undergraduate experiences, first and current jobs, and the suitability of their educational background and job-related abilities. Data on the curriculum's applicability and graduates' degree of satisfaction with their academic preparation can also be gathered through graduate tracer studies [2].

Tracer surveys are studies that collect feedback from graduates of an educational institution to track their achievements and development in their careers and give policy bodies valuable information on major topics [3]. This was highlighted by Mubuuke, A., Businge, F., and Kiguli-Malwadde (2014 as referenced in Kalaw, 2019). Tracer surveys are generally used to assess the medium- to long-term effects of educational initiatives. More specific goals include bettering the curriculum and study environments for education and training, facilitating the transfer of graduates from academia to the workforce, and better balancing the supply and demand of skills [4].

After 15 years, a new kind of tracer research appeared: more educational institutions are carrying out tracer studies on their own, occasionally working closely with other educational institutions (network approach). Often, the most significant component of these institutional tracer studies is feedback for curriculum development and other areas of enhancing study circumstances and amenities. The horizontal link between education and work is of particular importance, and information concerning job search, employment circumstances, and work are interpreted as indicators of graduates' prospects on the labour market from various study courses [5].

Obtaining a higher education degree is primarily seen as an investment and a way to elevate one's standing within the family in developing nations like the Philippines. Filipino parents make significant sacrifices to support their children's education. Some parents, particularly those from the middle class, take out loans, sell off some of their properties, and even accumulate debt. One of the current trends in Philippine education is the presence of working students.

One way higher education institutions make sure the quality of education they offer meets industry demands is by looking at how employable their graduates are [6]. higher education institutions

Graduates from educational institutions are consistently producing workers that can adapt technology and knowledge-based information to the needs of their workplaces [7].

One of the greatest mathematicians of all time, Carl Friedrich Gauss, once referred to mathematics as the "Queen of the Sciences" [8]. It is a discipline that is applicable to all fields and has a rich, varied, and dynamic theory with many different applications. The necessity to approach real-world problems methodically gave rise to mathematics. It is still evolving today because the abstractions created to address these issues lead to both future abstraction expansions and their practical implementations. There are two categories of mathematics: applied mathematics and pure mathematics. The study of structures, their constituent parts, and their interrelationships is a component of pure mathematics. The application of mathematics to different fields of study is known as applied mathematics. As a result, the undergraduate study in mathematics and applied mathematics can play a significant and interesting role in preparing students for a variety of professions as well as for informed and involved citizenry [9].

Students who are interested in studying mathematics as a discipline of logical reasoning might enrol in the Bachelor of discipline in Mathematics programme. The curriculum acts as a training ground for students to get a strong foundation in mathematics and its applications in various disciplines, including industry and research, as well as problem-solving abilities. Furthermore, it was intended to generate highly qualified workers with strong analytical and logical skills for the government, business sector, and academia.

The program's goals align with the College of Science's mission to produce capable graduates who possess scientific attitudes, who think critically and methodically, and who can use research to advance science and technology. It should be mentioned that these goals serve as the foundation for all activities, both within and outside of the classroom.

The curriculum follows the Policies, Standards, and Guidelines (PSGs) for the BS Mathematics Programme, which are contained in the CHED Memorandum Order (CMO), in order to accomplish the same. Students must perform undergraduate research on subjects that interest them and are on the College's research agenda in order to enhance the programme.

The main objective of this study was to assess the employability of Bachelor of Science in Mathematics graduates between 2001 and 2015. It specifically aimed to ascertain the number of graduates who are employed, regardless of whether their employment is related to their course, as well as the unemployed and underemployed graduates, their occupational classification, the amount of money they make from their jobs, the length of time they spent looking for work after graduation, and the reasons behind any gaps in time between graduating and starting their first job. It also determined how much the study programme contributed to the graduates' professional and personal development and how highly they regarded the degree programme they completed at the College of Science.

- **Materials and Methods**

The descriptive research design was employed in the tracer study. One hundred and ten BS Math graduates from 2001 to 2015 were the study's responders. The primary tool was a questionnaire with three sections: the profile of the responder, the respondent's employment details, and the abilities they had acquired that helped them advance both personally and professionally.

With a few modifications, the University of Santo Tomas Graduate School tracer study questionnaire—which was anchored by the CHED Graduate Tracer—was applied to the BS Math graduates of the University of Eastern Philippines' College of Science.

Names, addresses, and phone numbers were collected through social media and the index of undergraduate theses. While some of the questionnaires were given out in person by the researchers, others were distributed via Facebook Messenger and emails. The researchers also enlisted friends' assistance,

family members, as well as registered BS Maths students at the time we collected data for the in-person distribution of the questionnaire.

The information was tallied. The degree of competencies they had learned that were beneficial to them was ascertained using frequency counts, percentages, and weighted means; the relevance of the items employed was shown by ranking.

Results and Discussion

The majority of responders, 91 or 83.00%, had jobs. This may suggest that graduates of BS Maths can get employment with ease. 36 people, or 40.00%, work as teachers. This demonstrates the significance of including the 18 units of professional education courses in the redesigned BS Maths curriculum from 2010. Nineteen, or seventeen percent, of the graduates had no data collected. The majority of respondents (43.00%) had contracts in place, followed by permanent

status (35.00%), self-employment (5.00%), and other arrangements. Many people believe that teaching secondary high school is the only job option open to graduates with a bachelor's degree in mathematics. Although there are various employment alternatives available, it is true that this degree can qualify for such a career.

Fig. 1. Employability of BS Mathematics graduates

The majority of our respondents—36, or 40.00 percent—are all professionals, followed by clerks. The respondents' least common current occupation is trade or associated work, where he sells glass supplies. There are increased options for BS Math graduates to get employment as teachers due to the need for instructors created by the K–12 implementation.

Ninety-two percent, or 84 graduates, are employed in the Philippines. The outcome suggests that there is a need in the Philippines for graduates in mathematics.

42.00% of BS Math graduates made between 21,000 and 30,000 pesos per month, whereas 43.00% made between 10,000 and 20,000 pesos. Many positions in companies, such as those of teacher 1 or credit collection specialist, pay between 10,000 and 20,000 pesos.

Fig. 2. Career Path of BS Mathematics graduate

Thirteen percent of the graduates are underemployed, while seventy percent of the graduates have jobs connected to their courses. This suggests that there are many different career options available to BS Maths graduates. The jobs of the respondents who were underemployed in this study included labourers, security guards, and some office or company clerks.

Because they had to take the Teacher Licensure Examination, the majority of them were hired after a year or two. Since teaching is their area of expertise and they can support themselves financially, they decided to stay in their initial position.

Table 1. Rate the contribution of the program of your study at the college of science to professional growth

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Indicators	Weighted Mean	Rank
Academic Preparation	3.30	8
Research Capability	3.41	3
Learning Efficiency	3.77	2
Communication Skills	3.19	10
People Skills	3.25	9
Problem Solving Skills	3.88	1
Information Technology Skills	3.35	6
Meeting Present and Future Professional Needs	3.30	7
Exposure to Local Community within Field of Specialization	3.19	11
Exposure to International Community within Field of Specialization	2.84	13
Critical Thinking Skills	3.37	5
Salary Improvement and Promotion	3.37	5
Opportunities Abroad	2.93	12
Personality Development	3.40	4

According to the comments, their study programme had a significant impact on both their personal and professional development in terms of problem-solving abilities and learning efficiency (Table 1). This suggests that the graduates of the BS in Mathematics have a solid foundation in problem-solving abilities. With a weighted mean of 2.84, exposure to the global community within the field of specialisation received the least amount of responses. Because this was not emphasised in the curriculum, it is implied that graduates of the Bachelor of Science programme in mathematics have little exposure to the global community.

The replies also demonstrated that students' perceptions of their degree programme at the College of Science are influenced by their interactions with teachers and their pedagogical ability (Table 2). This suggests that the teacher and students had a solid rapport because there weren't many students enrolled in the BS Math programme and they knew one other well. The library

resources received the lowest response, with a weighted mean of 3.0. Students and teachers at the university have long had issues with the library's collection.

Table 2. Rate of the degree program at the college of science

Indicators	Weighted Mean	Rank
Range of Courses	3.35	10
Relevance to your Profession	3.65	4
Extracurricular activities	3.40	9
Premium Given to Research	3.12	11
Interdisciplinary Learning	3.63	5
Teaching and Learning Environment	3.51	7
Quality of Instruction	3.35	10
Teacher-Student Relationship	3.77	1
Library Resources	3.0	12
Laboratory Resources	3.53	6
Class Size	3.44	8
Professors' Pedagogical Expertise	3.74	2
Professors' Knowledge of Subject Matter	3.72	3

• Conclusion and Recommendation

After serving a one- to two-year waiting period following graduation due to their completion of the Teacher Licensure Examination, the majority of BS Math graduates found gainful employment. The majority of them are employed in the Philippines under contracts. After graduating, the majority of them continued to work in their first jobs as teachers. Clerical work is ranked second among the jobs. The majority of them make between 10,000 and 20,000 between 21,000 and 30,000 pesos a month. Their ability to solve problems has helped them both personally and professionally. The mentor-student dynamic was pertinent to their course of study as graduates of the Bachelor of Science in Mathematics.

Based on suggestions from the professors and graduates, the following recommendations have been made:

• Form closer links with other academic institutions to offer exposure to regional and global prospects.
Before they graduate, include an English proficiency programme to improve their written and spoken communication skills.
• The Department of Mathematics at the College of Science should provide an annual report on the status of its graduates and maybe solicit proposals for curriculum improvement. Graduate units with a tracer are advised.
It is recommended that BS Mathematics students participate in trainings, seminars, and other activities to enhance their confidence in securing employment.
Adequate library resources should be provided by the university.

Competing Interests

The authors have stated that there are no conflicting interests.

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