



Employability Outcomes and Career Profiles of BSED Mathematics Graduates

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Abstract

The quality and relevance of the education received by graduates play an important role in helping them obtain meaningful employment. This study investigated the employability outcomes and career profiles of Bachelor of Secondary Education (BSED) majors in mathematics graduates. A mixed-method approach was conducted to gain deeper insights into graduates' skills, competencies and preparedness for the demands of the job market. The findings revealed that most BSED Mathematics graduates are successfully employed, particularly in teaching positions in public and private schools. Many have secured stable employment and are earning salaries appropriate for beginning professionals. The majority are working in occupations aligned with their field of specialization, although some have pursued opportunities outside their locality and abroad. Employment was commonly obtained through job applications, networking and institutional support, indicating the relevance of individual job-search strategies and institutional support in graduates' transition to employment. Graduates reported that academic performance, practicum experiences, soft skills, job application skills and additional certifications or training contributed to their employability. Furthermore, graduates expressed satisfaction with the quality of education provided by the program and highly evaluated the competencies they developed, particularly in mathematical, analytical, pedagogical and professional skills. However, they also identified areas for improvement, especially in technology integration, classroom management exposure and preparation for professional and administrative responsibilities. Continuous enhancement of the curriculum, practicum experiences, educational technology integration and career preparation initiatives is recommended to better respond to the evolving demands of education and the labor market.

Keywords: BSED Mathematics Graduates, Career Profile, Employability Factors, Employability Outcomes, Professional Competencies, Teacher Education.

Introduction

Employability is considered an important indicator of the effectiveness and relevance of higher education institutions in preparing graduates for the labor market. Universities and colleges are increasingly expected to develop not only academic knowledge but also practical skills, competencies and professional attitudes needed in the workplace. Graduate employability refers to an individual's ability to obtain, maintain and progress in employment relevant to their educational background and professional training. Employability in terms of how higher education institutions prepare students to become effective in the workplace through knowledge, skills and personal attributes (1). Similarly, graduate employment outcomes are influenced by disciplinary expertise and transferable skills such as communication, critical thinking and problem-solving (2, 3). For higher education institutions, examining graduate employability provides

evidence of whether academic programs remain responsive to changing workplace requirements. Modern labor markets increasingly require technical competence, digital literacy, interpersonal skills and adaptability. In response, institutions have incorporated experiential learning, industry engagement and competency-based education to strengthen workforce readiness (4). Thus, employability is not limited to securing employment but also reflects the relevance of academic preparation to professional practice and career development. In teacher education, employability is particularly significant because graduates are expected to demonstrate both disciplinary knowledge and pedagogical competencies for effective teaching. Mathematics teachers contribute to learners' development of logical reasoning, analytical thinking and quantitative literacy. The National Council of Teachers of Mathematics emphasizes developing

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critical thinking and informed decision-making. Hence, BSED Mathematics graduates need mathematical knowledge, pedagogical competence, communication skills, technological capabilities and professional dispositions to perform effectively in educational settings.

Graduate tracer studies are widely used to examine whether higher education programs adequately prepare graduates for professional practice. These studies provide information on employment status, career development, job alignment and graduates' perceptions of the relevance of their academic preparation. They also provide evidence for curriculum evaluation and program improvement (5). Tracer studies can help institutions determine how program relevance and graduate competencies relate to employment success and career development (4). For teacher education programs, such evidence can indicate whether graduates enter occupations related to their specialization and whether the competencies developed during their studies are useful in actual professional settings.

In the Philippines, graduate employability remains an important concern amid changing labor-market conditions. The Philippine Statistics Authority reported changes in employment conditions during and following the COVID-19 pandemic. Although employment conditions have gradually improved, graduates may still experience difficulties in obtaining stable and degree-related employment. Philippine tracer studies have generally reported favorable employment outcomes while identifying concerns related to job alignment, curriculum relevance, technical competencies and practical training. Employment outcomes and program-related factors have been found to be relevant to the employability of education graduates (6), while curriculum relevance, technical competencies and internship experiences have been identified as significant factors associated with the employability of Information Technology graduates (7). Similarly, the contribution of industry exposure and practical training to the employment outcomes of hospitality and tourism graduates (8). These findings demonstrate that employability outcomes may vary according to discipline, program and institutional context.

Despite the growing body of tracer studies, limited evidence is available on the employability

outcomes and career profiles of graduates specifically from mathematics teacher education programs in geographically localized settings. Studies involving multiple programs or larger institutional populations may not fully capture the employment experiences and professional needs of graduates from specific campuses. This is particularly relevant in geographically remote higher education settings, where employment opportunities, professional networks, mobility and institutional resources may influence graduates' career trajectories.

At Ilocos Sur Polytechnic State College (ISPSC) Cervantes Campus, limited documented evidence is available regarding the employment outcomes and career experiences of graduates of the Bachelor of Secondary Education (BSED) major in Mathematics program. Although broader tracer studies may be conducted within the institution, campus-level evidence is necessary to determine the employment status, career pathways and perceived competencies of graduates from this specific program. Such information can provide a basis for curriculum enhancement, improvement of practicum experiences, career preparation and interventions responsive to graduates' professional needs.

The present study therefore examines the employability outcomes and career profiles of BSED Mathematics graduates of ISPSC Cervantes Campus. It considers their employment and career profiles, factors influencing employment, satisfaction with the quality of education provisions and skills and competencies developed through the program. It also explores graduates' perceptions of their preparedness for employment and professional practice.

Specifically, the study seeks to answer the following research questions: What is the employment and career profile of BSED Mathematics graduates in terms of employment status, type of work agency, appointment status, monthly income, job-related profile, location of employment and manner of obtaining employment?, What factors do BSED Mathematics graduates perceive as influencing their current employment status? and What is the level of satisfaction of BSED Mathematics graduates with the quality of education provisions provided by the program? and What skills and competencies do BSED Mathematics graduates perceive to have

developed through the program and what areas for improvement do they identify regarding their preparation for employment and professional practice?

Methodology

Research Design

This research employed a mixed-methods approach, combining quantitative and qualitative data collection methods, to gain a comprehensive understanding of the employability outcomes of BSED Math graduates at ISPSC Cervantes Campus.

Research Site

The study was conducted at the Ilocos Sur Polytechnic State College (ISPSC)–Cervantes Campus, located in Cervantes, Ilocos Sur, Philippines. The campus is situated in an upland municipality in the southern part of Ilocos Sur and serves as one of the campuses of ISPSC offering teacher education programs, including the Bachelor of Secondary Education (BSED) major in Mathematics. The approximate geographic coordinates of the research site are 16.9917° N latitude and 120.7333° E longitude. These coordinates represent the approximate location of the Cervantes area and are provided to geographically identify the research setting.

Sources of Data

The target population consisted of all graduates of the BSED Mathematics program of ISPSC–Cervantes Campus from its first graduating batch through 2024. A total enumeration approach was initially adopted because the population consisted of only 24 graduates. Of the 24 graduates identified as eligible for participation, 21 responded to the survey, representing 87.50% of the total population, while three graduates did not respond despite the researchers' efforts to reach them. The three non-responders were excluded from the quantitative and qualitative analyses because no usable responses were obtained from them.

The qualitative data were obtained from the written responses to the open-ended questions included in the survey questionnaire. Because the responses were provided in written form, no audio recording or transcription was necessary. The researchers compiled and organized all responses for systematic analysis. The researchers first read the responses repeatedly to become familiar with the data and identify significant statements relevant to the objectives of the study. Initial codes

were assigned to meaningful words, phrases and statements that reflected graduates' employment experiences, competencies, workplace preparedness and perceived areas for program improvement. Responses with similar meanings or ideas were grouped into categories. The researchers then compared and reviewed the categories to identify recurring patterns and relationships among the responses.

Themes were generated by grouping related categories that represented broader and recurring ideas across the participants' responses. The emerging themes were reviewed against the original responses to ensure that they accurately reflected the participants' experiences and perceptions. The final themes were then named and defined based on their central meanings and relevance to the research objectives. Selected verbatim responses were presented to support and illustrate each theme.

Instrument

A modified survey questionnaire based on the CHED Graduate Tracer Study (GTS) Questionnaire was utilized to gather data from the BSED Mathematics graduates. The instrument was adapted to suit the objectives and context of the present study. It consisted of several parts that focused on the graduates' employability profile, factors influencing their current employment status, level of satisfaction with the BSED Mathematics program and level of agreement regarding the skills and competencies developed through the program. The questionnaire was designed to obtain relevant information regarding the graduates' employment experiences, professional preparation and perceptions of the effectiveness of the program in equipping them with the competencies needed in the workplace.

Semi-structured interviews were also conducted to gather deeper insights of the graduates on their skills, competencies and preparedness for the demands of the job market.

Statistical Treatment

The quantitative data were encoded, tabulated and analyzed using IBM SPSS Statistics 26. Frequency and percentage were used to summarize the graduates' employability and career profiles. A weighted mean was used to determine the perceived influence of selected factors on graduates' employment status, their level of satisfaction with the quality of education

provisions and their perceived level of skills and competencies developed through the BSED Mathematics program.

For the qualitative component, the written responses to the open-ended questions were analyzed using thematic analysis. The researchers systematically reviewed the responses, assigned initial codes to meaningful statements, grouped similar codes into categories and identified recurring patterns from which themes were developed and refined. Selected responses were presented as supporting evidence for the identified themes, with participant codes used to maintain confidentiality.

Ethical Considerations

This study adhered to ethical principles, ensuring

informed consent, confidentiality and voluntary participation. It acknowledged potential limitations, including the self-report nature of the data, possible response bias and the specificity of findings to the context of Ilocos Sur Polytechnic State College-Cervantes Campus.

Results and Discussion

Figure 1 shows employability profile of the graduates in terms of employment status shows that a significant percentage of the respondents are successfully integrated into the workforce, as shown in Figure 1. The figure shows that most graduates have found work after finishing their degrees, indicating that the knowledge and abilities they have gained are typically in line with the needs of the labor market.

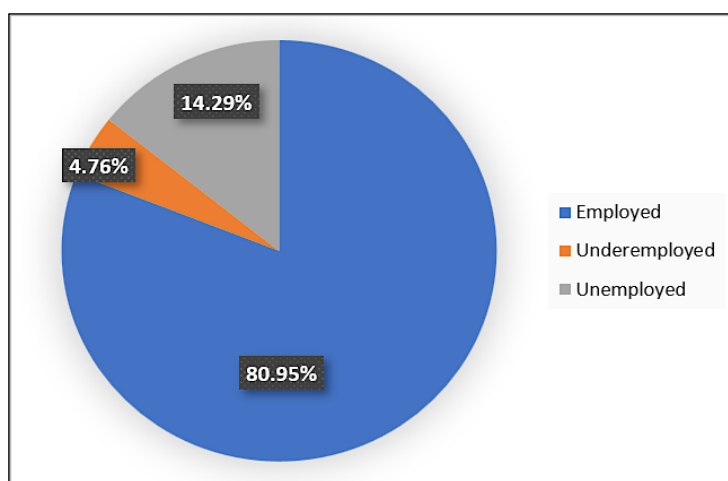


Figure 1: Employment Status

The high employment rate suggests that the institution's academic preparation program has improved graduates' employability. It also shows how capable the graduates are of using their knowledge and abilities in professional settings and competing in the labor market. This finding supports the idea that higher education institutions play a significant role in preparing students for employment and career opportunities. Additionally, the comparatively small proportion of underemployed graduates indicates that most employed graduates are able to secure jobs that are typically suitable for their training and credentials. A logistic-regression study of 300 Kazakhstan graduates found that limited job availability and lack of experience reduced employment likelihood, while personal

connections, technology and entrepreneurship improved prospect (9).

Overall, the results show that although most graduates find successful employment, a tiny percentage face difficulties with job availability, work experience, personal circumstances, or pursuing more education. These findings emphasize how crucial it is to develop industry connections, internship opportunities and career counseling programs to help graduates obtain appropriate job experience and facilitate a smoother transition from education to employment. To increase employment prospects for graduates, the university can also think about improving career placement services and collaborations with employers.

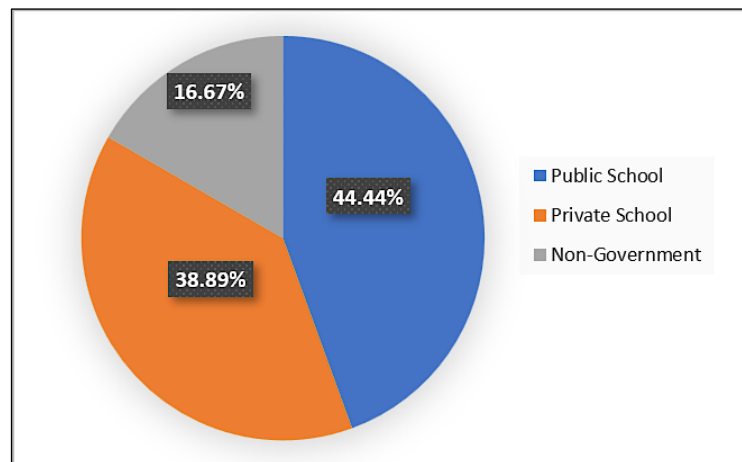


Figure 2: Type of Work Agency

Figure 2 presents the distribution of graduate respondents according to the type of work agency where they are currently employed. The results indicate that many of the graduates are working in the education sector, particularly in public schools. The large proportion of graduates working in public schools shows that many respondents were able to secure teaching positions within the government education system. Public schools often provide more stable employment opportunities, competitive compensation and professional development programs for teachers. In the Philippines, the demand for qualified teachers in public schools remains high due to the continuous expansion of basic education programs and the implementation of reforms aimed at improving the quality of education. According to the Department of Education, strengthening the teaching workforce remains a priority to ensure that learners receive quality instruction in public schools. This may explain why a considerable proportion of graduates choose to pursue careers in government educational institutions. However, contrasting findings show that many teacher-education graduates initially entered private schools through contractual or provisional appointments and received relatively low salaries, while some unemployed and self-employed graduates continued waiting for public-school opportunities (10).

Meanwhile, 38.89% of the graduates are employed in private schools, indicating that private educational institutions also serve as an important

employment sector for BSED Mathematics graduates. Private schools often provide opportunities for beginning teachers to gain professional experience, especially for those who are still in the process of securing permanent teaching positions in the public sector.

A smaller proportion of the graduates, 16.67%, are employed in non-government organizations (NGOs). This suggests that some graduates explore career paths beyond traditional classroom teaching. NGOs often implement educational programs, community development initiatives and training activities that require individuals with strong educational backgrounds. Graduates working in these organizations may contribute to educational outreach programs, community-based learning initiatives, or capacity-building projects. Overall, the findings indicate that BSED Mathematics graduates are primarily employed in the education sector, particularly in public and private schools. This suggests that the training and competencies developed in the program are aligned with the employment demands of the teaching profession. Furthermore, the presence of graduates in non-government organizations demonstrates that the skills acquired in the program are also applicable in broader educational and community-based contexts. UNESCO in 2021 reports that teacher education programs play a crucial role in preparing graduates not only for classroom teaching but also for broader educational roles that support community learning and development.

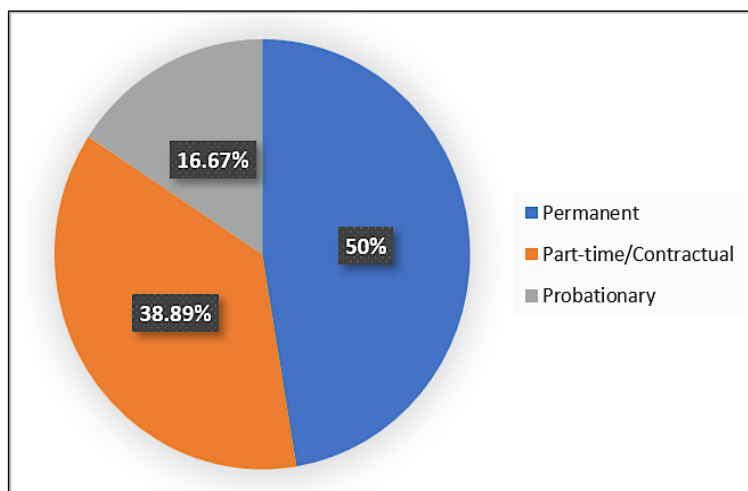


Figure 3: Appointment Status

Figure 3 presents the appointment status of graduate respondents in their current employment. The findings indicate that while a considerable number of graduates have already secured stable employment, others are still in transitional employment arrangements as they gain experience and establish their careers.

The high percentage (50%) of graduates holding permanent positions suggests that many respondents have successfully obtained stable employment in their respective institutions. Permanent employment is often associated with greater job security, benefits and opportunities for professional growth. In the teaching profession, obtaining a permanent position is an important milestone because it reflects the institution's confidence in the teacher's competence and performance. According to the Department of Education, teachers in public schools typically undergo a screening and evaluation process before being granted permanent appointment, which may explain why some graduates initially start with temporary or probationary employment before securing permanent positions.

Meanwhile, 38.89% of the graduates are employed on a part-time or contractual basis. This suggests that some graduates are still in the early stages of their careers or may be waiting for more stable employment opportunities. Studies on graduate employment indicate that many early-career professionals begin with temporary or contractual

roles before transitioning to permanent positions as they gain experience and demonstrate competence (11).

In addition, 16.67% of the graduates are in probationary status, which is typically a transitional phase before obtaining permanent employment. During this period, teachers are usually evaluated based on their teaching performance, professional behavior and ability to meet institutional expectations. Probationary employment allows institutions to assess the suitability of teachers for long-term roles while also giving new graduates the opportunity to develop their professional skills and adapt to workplace demands.

Overall, the findings indicate that a significant proportion of the graduates have already achieved employment stability, while others are still progressing toward permanent positions. This reflects the typical career progression of many beginning teachers, where employment may initially start with temporary or probationary appointments before transitioning to permanent roles. These results suggest that the competencies developed in the BSED Mathematics program have helped graduates secure employment opportunities, although continued professional development and experience may further enhance their chances of obtaining stable and long-term teaching positions.

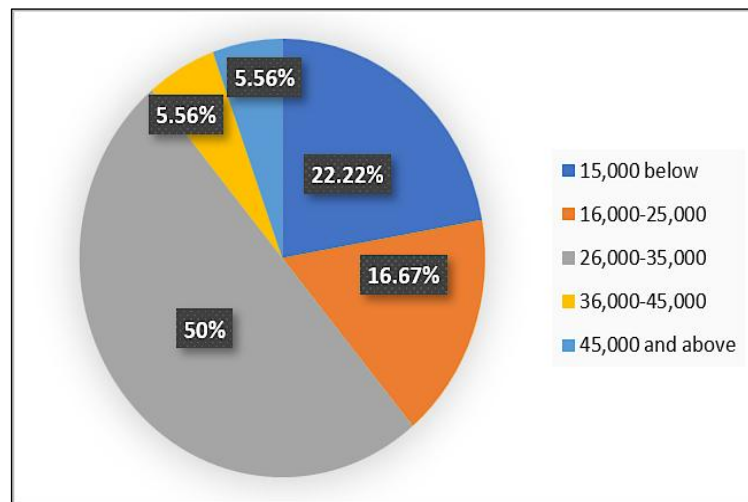


Figure 4: Monthly Income

Figure 4 shows the monthly income distribution of the BSED Mathematics graduates employed in different institutions. The results suggest that some graduates are still in entry-level positions or working in private institutions and contractual appointments where salary levels are relatively lower. On the other hand, higher income levels may indicate that some graduates have already obtained permanent employment, gained professional experience, or are employed in institutions that offer higher compensation. Other tracer studies have similarly reported that

employment outcomes, including salary levels, tend to improve as graduates develop workplace skills and accumulate professional experience (12). Tracer studies serve as an important mechanism for assessing the relevance of academic programs by examining the employment outcomes of graduates, including job placement and income levels (4). Likewise, employability studies emphasize that graduates' competencies and professional preparedness significantly influence their employment opportunities and career advancement (13).

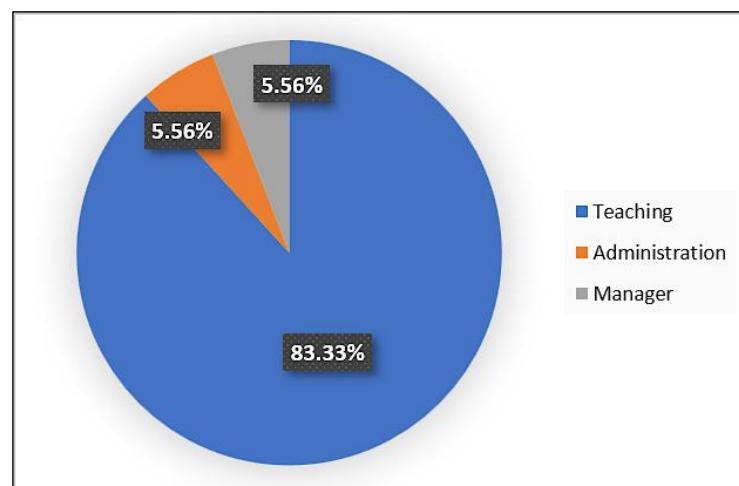


Figure 5: Job-Related Profile

Figure 5 presents the job-related profile of the BSED Mathematics graduates in terms of the type of position they currently hold. The findings indicate that most graduates are employed in professions that are directly aligned with their field of specialization, particularly in the teaching profession.

The high percentage of graduates working in teaching positions suggests that the BSED Mathematics program effectively prepares students for careers in education, which is the primary objective of the program. This alignment between the degree program and the graduates' current occupation demonstrates the relevance of the curriculum in equipping students with the

competencies required for the teaching profession. It also indicates that the graduates possess the necessary pedagogical knowledge, mathematical competencies and professional skills needed to perform effectively as educators.

Meanwhile, a small proportion of graduates working in administrative and managerial positions indicates that some individuals have expanded their professional roles beyond classroom instruction. These positions may involve leadership responsibilities, school management tasks, or administrative support within educational institutions. This also reflects the potential for career mobility and professional advancement among graduates of the program.

These findings are consistent with previous tracer studies, which reported that education graduates

are most likely to pursue careers in teaching because their academic training is specifically designed to prepare them for the education sector. Studies have shown that graduates tend to obtain employment closely related to their field of study when the curriculum provides relevant competencies and practical preparation for professional practice (4). Similarly, tracer studies emphasize that the alignment between academic preparation and employment outcomes is a key indicator of program effectiveness in higher education institutions (12). Moreover, employability research highlights those graduates who acquire strong pedagogical knowledge and subject-matter expertise are more likely to secure positions within their specialized fields (13).

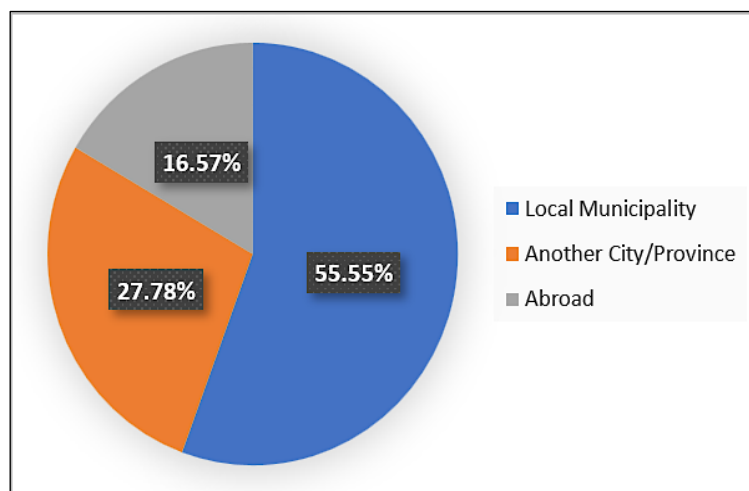


Figure 6: Location of Employment

Figure 6 presents the location of employment of the BSED Math graduates. It indicates that the majority of the graduates remain employed within their local communities after completing their degree. The large proportion of graduates working within the local city or municipality suggests that the institution significantly contributes to the development of the local workforce, particularly in the education sector. Many graduates may choose to work within their communities because of the availability of teaching opportunities in nearby schools and their commitment to serving local learners. This finding reflects the role of higher education institutions in producing professionals who support local educational development and community advancement.

Meanwhile, the 27.78% of the graduates working in other cities or provinces indicate that some graduates pursue employment opportunities

outside their immediate locality. This may be due to better career prospects, professional growth opportunities, or the availability of permanent teaching positions in other areas. Mobility among graduates is common as individuals seek institutions that offer more competitive employment conditions and professional development opportunities.

On the other hand, 16.67% of the graduates working abroad suggests that a portion of the graduates have accessed international employment opportunities. This indicates that the competencies and qualifications acquired from the BSED Mathematics program may be recognized beyond the local context. International employment among graduates also reflects the growing global demand for qualified educators and professionals with strong subject matter expertise. These findings support previous tracer studies,

which emphasize that the location of employment among graduates often varies depending on job availability, professional opportunities and career aspirations (12). Similarly, research on graduate employability highlights those graduates may initially seek employment within their local areas but may later expand their career opportunities to other regions or countries as they gain experience

and professional qualifications (4, 14). Furthermore, studies on graduate mobility suggest that higher education institutions contribute not only to local workforce development but also to the preparation of graduates who can compete in broader national and international labor markets (13).

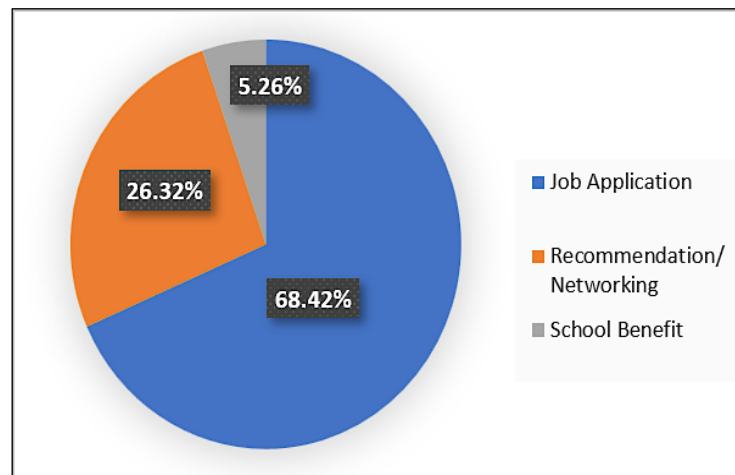


Figure 7: Manner of Accepting the Job

Figure 7 presents how the graduates obtained or accepted their first job. The findings indicate that formal job application and professional networking are the most common pathways for graduates to obtain employment. The equal percentage for job application and recommendation suggests that both individual initiative and professional connections play an important role in securing employment opportunities. Submitting job applications reflects graduates' proactive efforts to enter the workforce, while recommendations and networking highlight the value of social and professional relationships in gaining access to employment opportunities.

The presence of graduates who obtained employment through school benefits, although small, demonstrates the importance of

institutional support in facilitating graduates' transition to the workforce. Higher education institutions often establish partnerships, internship opportunities and referral systems that help graduates access employment opportunities more easily after graduation.

These findings are consistent with employability studies, which emphasize that multiple pathways contribute to graduates' entry into the labor market, including direct job applications, professional networks and institutional support systems (4). Similarly, tracer studies have highlighted those networking and personal referrals significantly influence graduates' employment outcomes because employers often rely on trusted recommendations when recruiting candidates (12).

Table 1: Factors Influencing their Current Employment Status

Factors Influencing Employment	Weighted Mean	Descriptive Equivalent
Academic performance in the BSED Math program	3.61	Highly Influential
Internship/practicum experiences	3.61	Highly Influential
Networking and connections	2.83	Moderately Influential
Job application skills	3.44	Highly Influential
Soft skills (e.g., communication, teamwork)	3.72	Highly Influential
Additional certifications or trainings	3.29	Highly Influential
Average Weighted Mean	3.41	Highly Influential

Table 1 shows that several factors contributed to the graduates' current employment status. Overall, the factors obtained an average weighted mean of 3.41, which is interpreted as "Highly Influential." This indicates that the identified factors played an important role in helping graduates secure employment after completing the BSED Mathematics program.

Among the listed factors, soft skills such as communication and teamwork obtained the highest weighted mean, which suggests that employers place strong value on interpersonal and collaborative abilities. Graduates who can communicate clearly, work effectively with others and demonstrate professionalism are more likely to succeed in the workplace. These skills are essential not only in teaching but also in other professional environments where interaction and cooperation are required.

Both academic performance in the BSED Mathematics program and internship or practicum experiences are also interpreted as highly influential. This indicates that strong academic preparation, meaningful pre-service experiences and practice teaching helped graduates build the competence and confidence needed to enter the workforce. Good academic performance reflects mastery of subject matter and teaching strategies, while practicum experiences provide opportunities for students to apply what they have learned in real classroom situations. These experiences allow graduates to develop practical teaching skills and become more prepared for their professional roles. Another factor that was rated Highly Influential is job application skills, which implies that the ability

of graduates to prepare resumes, perform well in interviews and present their qualifications effectively also contributed to their employment. Possessing the necessary knowledge and confidence during the application process can significantly increase the chances of obtaining a job. Similarly, additional certifications or training received are also interpreted as highly influential. This finding suggests that participating in seminars, workshops and other professional development activities helped graduates strengthen their qualifications. The additional training courses may have provided them with updated knowledge and skills that made them more competitive in the job market.

Meanwhile, networking and connections obtained a weighted mean of 2.83, interpreted as "moderately influential," making it the least influential factor among those listed. Although professional connections can sometimes open employment opportunities, the results indicate that graduates relied more on their academic preparation, skills and training rather than personal connections when seeking employment. Overall, the findings suggest that graduates' employability is largely influenced by a combination of academic competence, practical teaching experience, professional skills and continuous learning opportunities. These results highlight the importance of maintaining strong academic programs, providing meaningful practicum experiences and encouraging students to participate in professional development activities to better prepare them for employment after graduation.

Table 2: Level of Satisfaction with the Quality Education Provisions Provided by the BSED Math Program

Quality Education Provisions	Weighted Mean	Descriptive Equivalent
Availability of course materials and different learning resources needed for math studies. (e.g., textbooks, online resources, manipulative materials)	2.82	Moderately Satisfied
Quality of course content in math-related courses. (e.g., depth of knowledge, relevance to teaching practice)	3.06	Moderately Satisfied
Effectiveness of teaching methods used in math courses. (e.g., engagement, clarity, catering to diverse learning styles)	3.00	Moderately Satisfied
Conduciveness of the classroom environment for math learning. (e.g., physical space, positive atmosphere, access to technology)	3.18	Moderately Satisfied
Quality and relevance of practicum guidelines and activities for developing math teaching skills. (e.g., alignment with program objectives, opportunities for practical application)	3.35	Highly Satisfied
Effectiveness of partnerships with industry partners for practicum placements. (e.g., variety of placements, quality of supervision)	3.24	Highly Satisfied

Adequacy and quality of learning facilities for hands-on experiences in math education. (e.g., math labs, technology resources, access to manipulatives)	2.82	Moderately Satisfied
Opportunities for interaction and collaboration with fellow students through on-campus activities. (e.g., group projects, study sessions, peer learning opportunities)	3.12	Moderately Satisfied
Level of expertise and teaching effectiveness of faculty members in math education.	3.41	Highly Satisfied
Faculty commitment to continuous professional development and staying current in the field of math education.	3.35	Highly Satisfied
Effectiveness of training, seminars and workshops in preparing you for employment as a math teacher. (e.g., job search skills, resume writing, interview preparation)	2.88	Moderately Satisfied
Variety and fairness of assessment methods used in math courses to measure student learning effectively. (e.g., balance between different types of assessments, alignment with learning objectives)	3.18	Moderately Satisfied
Average Weighted Mean	3.12	Moderately Satisfied

As shown in Table 2, the graduates were generally moderately satisfied with the quality education provisions of the BSED Mathematics program. This suggests that while the program provided positive learning experiences, there remain areas that can be strengthened to further improve student preparation and overall program quality.

Graduates expressed the highest level of satisfaction with the expertise and teaching effectiveness of faculty members, highlighting the important role of competent and dedicated educators in promoting meaningful learning experiences. They also appreciated the faculty's commitment to professional development and the quality of practicum experiences, which helped them apply theoretical knowledge in real classroom settings and develop essential teaching competencies. Likewise, partnerships with cooperating schools were viewed positively, reflecting the value of strong institutional

collaborations in supporting teacher preparation. Research on practicum experiences indicates that partnership schools can provide inclusive and qualifying opportunities that support the development of professional teacher identity (15). On the other hand, graduates identified concerns regarding the availability of learning resources and the adequacy of facilities, suggesting a need for improved access to instructional materials, educational technologies and learning spaces that support mathematics instruction. Other aspects of the program, including course content, teaching approaches, classroom environment, student collaboration and assessment practices, were viewed favorably but still offer opportunities for enhancement. Graduates also indicated that training, seminars and workshops could be further strengthened to better prepare them for employment and professional practice.

Table 3: Level of Self-evaluation Regarding the Skills and Abilities Obtained at the Institution

Skills and Abilities Development	Weighted Descriptive	
	Mean	Equivalent
Organizational and leadership skills	3.39	Very High
Problem-solving and critical thinking skills	3.61	Very High
Ability to work independently as well as teamwork and team play	3.67	Very High
Creative thinking and creativity; initiative and taking a risk, if necessary.	3.67	Very High
Time management and decision-making skills	3.56	Very High
Writing competence and skills, including technical writing	3.44	Very High
Communication and interpersonal skills.	3.50	Very High
Computer and ICT Skills	3.28	Very High
Technical and Entrepreneurial Skills	3.17	High
Ability to work under pressure	3.61	Very High
Ability to write the essentials and basics of effective lesson planning	3.50	Very High
Code of ethics applied to my teaching profession	3.67	Very High
Knowledge of the different teaching methodologies, techniques and approaches through seminars and workshops	3.44	Very High

Expertise about multidisciplinary research that is essential for understanding students' needs and interests	3.39	Very High
Trainings, seminars and workshops about the preparation and evaluation of different instructional materials	2.94	High
Average Weighted Mean	3.46	Very High

Table 3 reveals that graduates perceived the BSED Mathematics program as highly effective in developing the knowledge, skills and competencies needed for their future profession, as reflected in the overall very high rating. This suggests that the program successfully contributed to the holistic development of graduates by strengthening their cognitive, interpersonal, pedagogical and professional capabilities.

Graduates particularly recognized the program's role in enhancing their ability to work independently and collaboratively, as well as fostering creativity and initiative. These competencies are essential in the teaching profession, where educators are expected to work effectively with colleagues, develop innovative instructional strategies and respond to diverse classroom needs. Recent research highlights that teamwork, creativity and adaptability are among the most important competencies teachers must possess in the 21st-century educational environment (16).

Likewise, the high ratings for critical thinking, problem-solving and the ability to work under pressure indicate that the program helped graduates develop resilience and higher-order thinking skills necessary for addressing challenges in educational settings. Critical thinking and problem-solving are recognized as key competencies that teacher education programs should cultivate to prepare future educators for complex classroom environments (17).

The respondents also acknowledged significant growth in communication, interpersonal, decision-making, time management and writing skills. These competencies are fundamental to effective teaching, as they enable educators to communicate concepts clearly, manage professional responsibilities efficiently and engage productively with students and stakeholders. Studies on graduate employability identifies entrepreneurship, professional development, teamwork, self-management, communication and problem solving as key graduate employability skills (18).

In addition, graduates expressed confidence in their lesson planning abilities and knowledge of various teaching methodologies, suggesting that the program provided a strong foundation in pedagogical practice and instructional design. Strong teacher preparation programs emphasize pedagogical knowledge, reflective practice and instructional planning to help future teachers deliver effective instruction (19).

Another notable strength of the program is its emphasis on professional ethics, as graduates demonstrated a strong understanding of ethical standards and responsibilities expected of teachers. This highlights the institution's commitment to developing not only competent educators but also responsible and ethical professionals.

While the results generally reflect positive outcomes, graduates identified opportunities for further improvement in technical and entrepreneurial competencies, as well as in the preparation and evaluation of instructional materials. Strengthening these areas through additional training, workshops and hands-on experiences may further enhance graduates' readiness to meet the evolving demands of the teaching profession. In particular, developing skills in designing instructional materials and integrating innovative teaching tools can further support effective mathematics instruction.

The findings suggest that the BSED Mathematics program effectively prepares students for their future roles as educators by developing a broad range of essential competencies, including cognitive, interpersonal, pedagogical and ethical skills. Continued enhancement of technical and instructional material development competencies can further strengthen the program and improve graduate preparedness for contemporary educational environments.

The qualitative analysis of the graduates' responses revealed two major themes that describe their perceptions of how the BSED Mathematics program prepared them for employment: strong foundation in mathematical knowledge and analytical thinking and areas for

program improvement. These themes highlight both the competencies developed during their academic training and the areas where additional preparation could further support graduates in transitioning to the workforce.

Strong Foundation in Mathematical Knowledge and Analytical Thinking

One of the most prominent strengths identified by the graduates is the strong foundation in mathematical knowledge and analytical thinking provided by the program. Several respondents emphasized that their academic training helped them develop critical thinking and systematic problem-solving skills that are essential in teaching mathematics and performing professional tasks.

One graduate shared:

"The technical preparation I received in my mathematics program was both rigorous and comprehensive. It equipped me with a strong foundation in advanced mathematical concepts, analytical reasoning and problem-solving techniques."

Similarly, another participant explained:

"Because of the rigorous training in analytical thinking and problem-solving, I am able to approach tasks with precision, logical reasoning and attention to detail."

Other respondents also expressed similar experiences:

"My background in mathematics helps me analyze problems carefully and find systematic solutions when facing challenges at work."

"The program strengthened my ability to think critically and solve complex problems, which is very helpful in my teaching profession."

These responses suggest that the program has been successful in developing graduates' analytical competence and mathematical expertise, which are essential skills for mathematics educators. Previous research has similarly emphasized that analytical thinking, critical reasoning and problem-solving abilities are among the most important competencies that higher education institutions develop to enhance graduate employability (20). These skills enable graduates to perform effectively in professional settings where logical reasoning and decision-making are required.

Development of Pedagogical and Instructional Competencies

Another important strength highlighted by the participants is the development of pedagogical and instructional competencies. Many graduates reported that the program equipped them with practical teaching skills, particularly in lesson planning, organizing classroom activities and delivering instruction effectively. Some of the verbatims

"Through rigorous coursework and hands-on activities, I learned how to design structured lesson plans, manage classrooms effectively and integrate educational technologies to support student learning."

"I felt most prepared in crafting detailed and structured lesson plans, especially in organizing learning objectives, activities and assessments effectively."

"Lesson planning and the use of technology are the skills I felt most prepared for after graduation."

"The program helped me understand different teaching strategies that I now apply when teaching my students."

These findings highlight the importance of teacher education programs in preparing graduates with the pedagogical knowledge and instructional skills required in real classroom environments. Similar results were reported in tracer studies of teacher education graduates, where many alumni attributed their employability to the teaching competencies and classroom management skills developed during their university training (21).

Development of Professional Attitudes and Workplace Readiness

In addition to technical and pedagogical competencies, graduates also emphasized the development of professional attitudes and workplace readiness. Participants noted that qualities such as reliability, adaptability, patience and the ability to work under pressure were frequently recognized by their colleagues and supervisors.

For example, one respondent shared:

"Others have often recognized my reliability, strong analytical thinking and ability to stay calm under pressure."

Other participants explained:

"Others have recognized my adaptability, my ability to work well under pressure and my ability to build relationships easily."

“Colleagues recognize me as dependable—someone they can count on even when tasks are tough or deadlines are tight.”

“My colleagues appreciate my patience when explaining mathematical concepts to students.”

These responses suggest that the program contributes not only to academic competence but also to the development of professional values and soft skills that support workplace success. Research on employability consistently highlights the importance of soft skills such as teamwork, communication, adaptability and professional ethics in improving graduates’ career prospects (22). Employers increasingly value these interpersonal competencies because they enable graduates to collaborate effectively and adapt to workplace demands.

Areas for Program Improvement

Although the graduates generally expressed positive perceptions of the program, several participants also identified areas where additional preparation could further enhance graduates’ readiness for the job market.

One of the most frequently mentioned concerns is the need for greater integration of educational technology in teaching. Some graduates explained that although they learned basic ICT skills during their studies, they encountered difficulties when using certain digital tools and educational software in actual teaching situations.

One participant explained:

“I felt unprepared in using certain educational software used in teaching mathematics.”

Another graduate emphasized the importance of technology skills in modern classrooms:

“Considering that we are now in a digital world, graduates must be equipped with technologies and software used in teaching.”

Other respondents also expressed similar concerns:

“I wish we had more training on digital tools and online platforms used in teaching mathematics.”

“Using some technology-based applications in teaching was challenging for me during my first year of teaching.”

These responses highlight the increasing importance of digital competence in the teaching profession. With the growing integration of technology in education, teachers are expected to effectively use digital tools to facilitate learning. Studies have shown that the rapid advancement of

educational technologies requires teacher education institutions to strengthen digital training and technology integration within their curricula (23). Another concern raised by the graduates relates to limited exposure to real classroom situations before entering the teaching profession. Some participants shared that classroom management and dealing with diverse student behaviors were challenging experiences during their early teaching years.

One graduate stated:

“Classroom management was challenging at first because I did not experience teaching a large number of students before entering the classroom.”

Another respondent explained:

“Handling diverse student behaviors in real classroom settings was something I learned gradually through experience.”

Similarly, another participant shared:

“I realized that managing a real classroom requires more practical exposure than what we experienced during training.”

Another graduate also mentioned:

“My first year of teaching was difficult because I had to learn classroom management through experience.”

These responses underscore the importance of strengthening classroom management preparation in teacher education programs. While graduates possessed sufficient content and pedagogical foundations, many felt that their exposure to actual classroom management situations was limited. This suggests that institutions should provide more opportunities for pre-service teachers to experience authentic classroom environments, manage larger and more diverse classes and develop practical strategies for maintaining discipline, promoting student engagement and responding effectively to classroom challenges. Experiential learning opportunities such as practicum and internship experiences allow students to apply theoretical knowledge in authentic classroom contexts, thereby improving their confidence and readiness for professional practice (18). In addition, effective experiential learning helps student teachers connect with communities and apply theory to practice, although it noted that studies were predominantly qualitative and lacked generalizable quantitative outcomes (24).

Finally, some graduates also highlighted the need for additional preparation related to professional and administrative responsibilities in schools. Participants explained that they encountered challenges when preparing employment documents and handling administrative tasks during their early employment.

One respondent shared:

"I wasn't knowledgeable about how to make a resume or complete the other requirements needed for job applications."

Another graduate explained:

"I struggled at first with preparing reports and documentation required in schools."

Other respondents also noted:

"It would be helpful if the program included more orientation about professional responsibilities and administrative tasks."

"Learning how to prepare professional documents for employment would have been helpful."

These insights indicate that integrating career preparation and professional orientation activities within the program may help graduates transition more smoothly from academic training to employment. Universities are increasingly encouraged to incorporate career development programs that prepare students for job application processes and workplace expectations (25).

Conclusion

The findings demonstrate that the Bachelor of Secondary Education (BSED) major in Mathematics program effectively prepares graduates for successful employment in the education sector. Most graduates are employed in teaching positions, particularly in public and private schools, indicating that the program provides the knowledge, competencies and professional skills required by the labor market. While most graduates have secured stable employment, a few experienced unemployment or underemployment due to labor market conditions, limited work experience, continuing education, or personal circumstances. Graduates also demonstrated career mobility by obtaining employment outside their local communities and, in some cases, abroad, reflecting the program's ability to prepare professionals who are competitive in both local and international contexts. Employment was primarily secured through formal job applications and professional networking, highlighting the

importance of career readiness and institutional support.

The study further revealed that graduates' employability is strongly influenced by academic performance, practicum experiences, soft skills, job application competencies and participation in professional development activities. These findings emphasize the value of combining strong academic preparation with experiential learning and continuous skills enhancement to improve employment outcomes.

Graduates generally expressed satisfaction with the quality of education provided by the BSED Mathematics program, particularly in terms of faculty expertise, practicum experiences and professional preparation. They also reported that the program effectively developed essential competencies, including critical thinking, problem-solving, communication, teamwork, lesson planning, ethical practice and time management. These competencies have contributed significantly to their professional effectiveness and career advancement.

Despite these positive outcomes, the graduates identified several areas for improvement. They recommended strengthening technology integration in mathematics instruction, providing greater exposure to authentic classroom management experiences, enhancing technical and entrepreneurial competencies and incorporating more comprehensive career preparation and professional orientation activities. Addressing these areas through continuous curriculum review, enriched practicum experiences, expanded digital learning opportunities and stronger industry and school partnerships will further improve the employability and professional readiness of future graduates.

Overall, the findings affirm that the BSED Mathematics program is effective in producing competent and employable graduates while highlighting opportunities for continuous quality improvement to ensure that the curriculum remains responsive to the evolving demands of mathematics education and the global labor market.

However, the study was limited by its small, campus-specific sample and reliance on graduates' self-reported experiences, which may limit the generalizability of the findings. Future studies may include larger samples, other institutions,

longitudinal tracer studies and employers' perspectives to further validate and expand the findings.

Abbreviations

BSED: Bachelor of Secondary Education, CHED: Commission on Higher Education, GTS: Graduate Tracer Study, ICT: Information and Communication Technology, ISPSC: Ilocos Sur Polytechnic State College, NGO: Non-Government Organization.

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Author Contributions

The authors contributed to the design, data collection, analysis and writing of this paper.

Conflict of Interest

The authors declare no conflict of interest.

Data Availability

The data supporting the findings of this study are available from the corresponding author upon reasonable request, subject to applicable ethical and confidentiality considerations.

Declaration of Artificial Intelligence (AI) Assistance

The authors used artificial intelligence (AI)-assisted tools solely to support language editing, grammar checking and improvement of the clarity and organization of the manuscript. No AI-assisted tools were used to generate, fabricate, manipulate, or analyze the research data. All figures presented in the manuscript were developed by the authors using Microsoft Excel based on the actual study data. The authors reviewed and verified all AI-assisted outputs and took full responsibility for the originality, accuracy, interpretation and integrity of the manuscript and its contents.

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