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EMPLOYMENT OF THE MASTER OF ARTS IN MATHEMATICS EDUCATION GRADUATES OF A UNIVERSITY IN NORTHERN PHILIPPINES

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ABSTRACT

This study aimed to trace the 2015 to 2019 MAME graduates in the College of Teacher Education for Graduate Studies of the University of Northern Philippines in terms of their personal profile, their work-related profile before and after taking their master's degree, reasons of taking up the program, competency level before and after taking the program, appraisal of the most useful courses offered in the program, evaluation on the contribution of the program to their personal and professional growth and assessment on the features of the program and suggestions of how to improve the program. The researcher utilized mixed method of research. The subjects were the MAME graduates, and a questionnaire and open-ended questions were sent to them thru various online flat forms. Based on the findings of the study, the following conclusions are derived: pursuing graduate studies chooses no sex, civil status or age as long as there is a will to improve one's self; students have math- related educational background and finished the program within the prescribed number of years; having master's degree could contribute greatly in landing a permanent teaching job in public schools; professional and personal growth and development is the strongest drive to pursue advance education; the program offers subjects that are useful which enhanced the teaching competencies of the graduates and consequently contribute to the holistic development of the graduates; and that there are areas needing improvement in the MAME program.

Keywords: tracer study, Mathematics education, masters, higher education

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INTRODUCTION

The current and future needs of societies undergoing social and economic change is a constant challenge to an educational institution. Its mission must provide quality education to produce graduates who are highly competent, efficient, and competitive in the labor market. It should prepare graduates the standard competencies needed to meet the challenges in their chosen profession.

Jobs are changing rapidly, and individuals are also changing their skill sets, either through education or through their work and life experience. Education systems have a key role to play in ensuring that opportunities are provided for all individuals to develop their skills continually in a lifelong learning perspective, enabling them to adapt to rapidly changing labor market requirements and conditions. It is important for policy makers to be aware of the importance of reducing the risk of creating large skills gaps that undermine the employability of individuals and impede the productivity of enterprises and the growth of economies.

The duty of educational institutions to breed human resources does not end to the day the students graduated from the program he has taken. Yet, they must ascertain accountability as to whether their program has influence on the individual, institution or the country by pinning down the performance of their graduates. The key challenge is not just that these graduates are employed, but that their employment best utilizes their education. A graduate with a degree in Education, for example, who finds employment as a cashier at a Supermarket, is not fully utilizing his education. Thus, the main point is just about employability of the graduates and alignment of their present job to their program.

As mentioned in the study of Pardo, and Relon (2016) the value of higher education is measured in its capacity to open doors to graduates for future employment and the establishment of their sustainable career path. In addition, in the Philippines, tracing graduates is a CHED mandates in its NHERA 2 because it provide evidence of the quality of education delivered as well as other issues that could be associated on the institution itself. Accreditation bodies like the AACCUP measure the relevance and quality of education through the contributions of graduates on employment.

Tracer study comprises one form of pragmatic study which offers valuable information for evaluating the results of the education in a specific institution of higher education. Similarly, it enables the institution of higher education to get information on possible insufficiencies in a given educational program which can serve as a basis for curricular enhancement. They can therefore be used to contribute to causal explanations of the relevance of the study conditions and services provided by the higher education institutions and the graduates' performance in the labor market (Teichler 2011, Schomburg and Teichler 2011, and Herman 2010). This information may be used for further development of the institution in the context of quality assurance (Schomburg 2003). The importance of graduate tracer studies is to incorporate improvements into the institutional effectiveness programs of universities or higher education institutions by collecting and analyzing information on graduates' professional and personal careers.

In this study, it will look into whether the university has equipped the Master of Arts in Mathematics Education (MAME) graduates from the years 2015 to 2019 with appropriate knowledge, skills, and upright attitudes necessary for teaching practice which is to be locally and globally competitive. According to Egesah and Wahome (2014), if universities are to improve their teaching and training of graduates the precedence should be to learn from their own graduates. Thus, results of the study will serve as the basis for curriculum review and re-engineering of the subject content to meet the global competitiveness. In addition, it will direct professors to plan appropriate teaching and learning activities and to stay up to date and improved on its drawbacks to meet the demands in the field and consequently assisting in its long-term sustainability.

Research Objectives

This study aimed to trace the 2015 to 2019 MAME graduates in the College of Teacher Education for Graduate Studies of the University of Northern Philippines. Specifically, it aimed to (1) determine the graduates' personal-related profile such as sex, age, civil status, eligibility; (2) determine their educational background; (3) reveal their work-related profile before and after graduating the MAME program; (4) uncover their reasons for taking the program; (5) establish their perception on their competency level before enrolling MAME and after graduation; (6) ascertain the most useful subjects to the graduates (7) present their perception level on the contribution of the MAME program to their personal and professional growth; (8) assess MAME features less likely encountered in the duration of their course; (9) expose the overall contribution of MAME to the graduates and (10) analyze graduates' suggestions about the curriculum.

METHODOLOGY

Research Design

This study utilized mixed method of research. The quantitative method was used in describing and analyzing the: graduates' profile and employment status; ways on how graduates find their present job and factors that enabled them to get their first job; cooperating industries/academic institutions that employed the graduates; present work status and their promotional status; and the most useful competencies and subjects to the graduates. The qualitative method was utilized in analyzing graduates' suggestions about the curriculum.

Research Methodology

The survey questionnaire was adopted from Pardo and Pichay (2016) consisted of the graduates' profile, and employment status; ways how graduates find their present job and factors that enabled them to get their first job; cooperating industries/academic institutions that employed the graduates; present work status and their promotional status; and the most useful competencies and subjects to the graduates.

The university commencement programs from 2015 to 2019 will be used to determine the names and home address of the respondents. Mobile phone, Facebook, Instagram and Yahoo Mail will also be utilized in gathering information due to COVID-19 Pandemic and for the overseas contract workers and migrants' respondents. Data collectors will also be employed to distribute and retrieve questionnaires to the graduates who cannot be located thru the above-mentioned means and to interview some of the employers of the respondents to gather feedbacks on the graduates' performance.

Ethical Considerations

The researchers applied the ethical guidelines of social science research throughout the whole process of data gathering, analysis and presentation. Permission for the conduct of the study will be obtained from the University of Northern Philippines through an Operational Plan. The research paper went through an ethics review committee of the university as indicated by the ERC Approval No. 4. Full consent of the respondents were sought thru a letter of consent. The dignity, rights, safety and well-being of the respondents were given primary consideration by ensuring the anonymity of the respondents and by treating the collected data with utmost confidentiality and security.

Research Participants

The respondents of the study were all MAME graduates from the years 2015 to 2019. The distribution of the respondents is presented in Table 1.

Table 1. Distribution of Respondents

Year Graduated	Male		Female		Total	
	f	%	f	%	f	%
2015	2	18.2	3	15.8	5	16.7
2016	3	27.3	7	36.8	10	33.3
2017	2	18.2	4	21.1	6	20.0
2018	2	18.2	1	5.3	3	10.0
2019	2	18.2	4	21.1	6	20.0
Total	11	100.0	19	100.0	30	100.0

Data Analysis

Frequencies and percentages were used to present the profile of the graduates such as their age, civil status, eligibility/ies, educational background, work-related profile, reasons for enrolling the MAME program, usefulness of the program subjects in their present job. On the other hand, the mean was used to determine the perceived competencies of the graduates before enrolling and after graduating the MAME program, perceived contribution of the program to the personal and professional growth of the graduates, and perceived value of the program. Lastly, ranking was utilized to present the results of thematic analysis on the qualitative part of the study. SPSS software was applied to analyzed quantitative data.

RESULTS AND DISCUSSIONS

Personal-related profile of the Graduates

It can be noticed in Table 2 that a great percentage of the graduates are in their 20s and 30s. There is an equal percentage of single and married respondents based on the results of 50 percent are married and 50 percent are single. Furthermore, all most all (93.33%) of the MAME graduates are PRC licensed holders and some of them are also passers of the Civil Service Examination as supported by about 16 percent passed the professional and 13 percent passed the sub-professional examination. Also, there are also holders of National Certificates and were eligible due to Presidential Decree 907, also known as "Granting Civil Service Eligibility to College Honor Graduates".

Table2. Personal profile of the Respondents

Personal Profile		**f**	**%**
Age			
20-29		13	43.33
30-39		12	40.00
40-49		4	13.33
50-59		1	3.33
	Total	30	100.00
Civil Status			
Single		15	50.00
Married		15	50.00
	Total	30	100.00
Eligibility*			
PRC		28	93.33
Civil Service		--	--
Sub-professional		4	13.33
Professional		5	16.67
PD No. 907		4	13.33
National Competency		4	13.33
Board examination for Insurance Agent		1	3.33

Educational Background of the Graduates

The next table (3) shows the educational background of the MAME graduates.

Table 3: Educational Background of the Respondents

Educational Background		f	%
Program in the Undergraduate			
BSED-Mathematics		22	73.33
BSE-Statistics		1	3.33
BS-Mathematics		5	16.67
BSGE		1	3.33
BSIE-PA-Mathematics		1	3.33
	Total	30	100.00
Year Graduated in the BS Program			
2009-2016		17	56.67
2002-2008		8	26.67
1994-2001		5	16.67
	Total	30	100.00
First (Year) Enrolled MAME Program			
2017		1	3.33
2016		3	10.00
2015		4	13.33
2014		10	33.33
2013		3	10.00
2012		6	20.00
2011		3	10.00
	Total	30	100.00
Number of Years to Finished the MAME Program			
5		3	10.00
4		7	23.33
3		14	46.67
2		6	20.00
	Total	30	100.00

It can be observed from the table that majority (73.33%) of the MAME graduates were Secondary Education graduates major in Mathematics. The others were graduates of mathematics-related courses such as Statistics and Engineering. Moreover, majority of the MAME graduates (56.67%) finished their baccalaureate degree between 1994 and 2016 and had enrolled in the MAME program within four years after graduating college. However, there were also some who enrolled even after 10 years of graduating their bachelor's degree. There was a great percentage of MAME enrollees during the year 2014 and graduates of 2016 as indicated by a percentage of 33.33. Furthermore, almost half of them (46.6 %) finished the MAME program within three years, which is just the right number of years to finish the program.

Work-related Profile of the Graduates

It can be noticed from the table that most of the graduates were already employed in either public (43.33%) or private (46.67%) institutions when they enrolled in MAME. It is remarkable to note that after their completion of the program, all of them (100%) are employed in government institutions such as in

public high schools and state university. The result indicates that their master's degree was a passport to be employed in public.

Moreover, most of the graduates (86.67%) were in the field of teaching when they enrolled in MAME. However, when they finished their master's degree, all of them are in the teaching arena. This shows that the degree earned in the graduate school gave them higher qualification to be part of the academic institutions.

Lastly, less than 50 percent of the respondents were holding permanent positions when they enrolled in MAME but this percentage increased when they graduated the program as indicated by 86.67 percent. In addition, those who were on part-time, and job-order were given permanent or contractual teaching positions.

Table 4: Work-Related Profile before enrolling MAME and After the Completion of the MAME Program

Profile	Before Enrolling MAME		Months After Graduation	
	f	%	f	%
Type of Agency				
Public	13	43.33	30	100
Private	14	46.67	--	--
Unemployed	3	10	--	--
Total	30	100	30	100
Nature of Work				
Teaching-Related	26	86.67	30	100
Non-teaching Related	1	3.33	--	--
Unemployed	3	10	--	--
Total	30	100	30	100
Work Status				
Permanent	14	46.67	26	86.67
Temporary	1	3.33	--	--
Contractual	7	23.33	4	13.33
Part-time	4	13.33	--	--
Job order	1	3.33	--	--
Unemployed	3	10	--	--
Total	30	100	30	100

The above results indicates that having a master's degree changes the nature and status of work of the respondents, and moved them into public learning institutions.

Reasons for taking up MAME Program

Table 5 displays the composed replies by the respondents about their reasons of enrolling the MAME program in the university. The replies of the respondents were thematically analyzed and came up with six major themes.

Table 5. Reasons for Enrolling MAME in the university

Reasons	**f**	**%**
1. Advancement and enhancement of knowledge and skills in mathematics education	7	23.33
2. Acquisition of new knowledge and thoughts about Mathematics	5	16.67
3. Quality of the MAME program in the university	4	13.33
4. Requirement for job permanency and promotions	4	13.33

5. Vertical alignment for both undergraduate and graduate programs	1	3.33
6. Professional and personal growth and development	11	36.67

Reason 1: Advancement and enhancement of knowledge and skills in mathematics education

Since the respondents were all graduate students in the university, one of their major reasons of enrolling the program was for them to advance and enhance their knowledge and skills along mathematics education (7 or 23.33%). According to a Chinese proverb, "Learning is like a rowing upstream: not to advance is to drop back". It is important to note that knowledge and continuous learning is indispensable. Advancing knowledge and skills will let individuals to realize the development of accelerating learning and will generate a scheme that would help them understand complex things.

Reason 2: Acquisition of new knowledge and thoughts about Mathematics

In the definition of Anderson (1982) knowledge acquisition is a process of absorbing new information in the memory. It is very essential to learn new other things about a particular concept to bridge it with prior knowledge and it can be a best way to fill in gaps between a learned and unlearned information about it. Respondents believed that enrolling master's program may let them acquire new knowledge and thoughts about mathematics (5 or 16.67%). Knowledge acquisition can be elevated when students will focus on the connotation of the new information (Mcnamara and O'Reilly, 2020).

Reason 3: Quality of the MAME program in the university

Another reason of the respondents (4 or 13.33%) why they need to enrol to the program is, they believed that the university are offering a quality of education. According to Slade (2017) in his Blog, "quality of education is one that is pedagogically and developmentally sound and educates the students in becoming an active and productive member of the society." Maintaining the quality of every program offered in universities will create a fruitful outcome on the part of students, however these outcomes may not be attained if administrators will not apply for program accreditations given by accrediting companies locally and internationally. According Corpuz (2016) from Accrediting Agency of Chartered Colleges and Universities in the Philippines (AACCUP), if programs in a university will pass the accreditation, then they will be benefited consequently. Corpuz (2016) emphasized that if a program passed the accreditation, they would lend prestige to a member institution, justified by the possession of quality standards and unremitting efforts to maintain them at high level. More so, it will help parents to know which program they may send their children to for quality education. It can make all individuals who are engaged in education to be more aware of the standards of excellence which they should strive to attain. In addition, passing a program accreditation will make possible for those who are proposing for funding and those who will be funded and to know what to support and how much support is given. Lastly, it will also help the university to identify its strengths and weaknesses and in what aspects it needs to develop (Corpuz, 2016). As of the moment, the Master of Arts in Mathematics Education in the University is presently an awardee of Level IV-Phase I accreditation status.

In the long run, there were now a numerous policy about how to raise the quality of education. In the blog written by School of Education of American University (2019) mentioned that there are five important things to improve the quality of education. These notes were stated to help policy makers to think and craft policies with regard to raising the quality of education.

Reason 4: Requirement for job permanency and promotions

Meanwhile, four (13.33%) respondents believed that enrolling the graduate program will help them look for job permanency and help them to be promoted.

Reason 5: Vertical alignment for both undergraduate and graduate programs

Aligning the post graduate program with undergraduate program keeps one going in a right track. This was the belief of one of the MAME graduates (1 or 3.33%). Cheyenne Mills (2017) from Kentucky Department of Education noted in her blog that "Vertical alignment helps us to make sure that teachers within a school or district are on the same page with their curriculum. Teachers work together to ensure that their strategies and content help to prepare students for higher level material."

Reason 6: Professional and personal growth and development

Another reason of enrolling the program as retorted by the respondents is for their professional and personal growth and development (11 or 36.67%). Pursuing advance education is considered to be a factor to influence the teaching practices of educators whether in private or in public schools since it is where teachers are able to gain new knowledge (Cote, 2020) and wisdom about their field of specialization, it helps educators to improve not only their content but also their pedagogical skills.

Perceived Competencies of the Graduates Before and After Completion of the MAME Program

Table 6. Perceived Competencies of the Respondents before enrolling MAME and After Graduation

Competencies	Before Enrolling		After Graduation	
	$\bar{x}$	DR	$\bar{x}$	DR
Content Knowledge	3.70	Much	4.53	Very Much
Pedagogical Skills	3.47	Much	4.37	Very Much
Information Technology Skills	3.57	Much	4.37	Very Much
Reporting Skills	3.57	Much	4.43	Very Much
Personal and Professional Development	3.63	Much	4.63	Very Much
Classroom Management Skills	3.70	Much	4.53	Very Much
Higher Order Thinking Skills	3.63	Much	4.30	Very Much
Communication Skills	3.50	Much	4.23	Very Much
Numeracy Skills	3.80	Much	4.50	Very Much
Research Skills	3.27	Moderate	4.14	Much
Literacy Skills	3.60	Much	4.23	Very Much
Learning Skills	3.60	Much	4.37	Very Much
Assessment Skills	3.57	Much	4.40	Very Much

Legend:

Ranges	DR
4.21 – 5.00	Very Much
3.41 – 4.20	Much
2.61 – 3.40	Moderate
1.81 – 2.60	Little
1.00 – 1.80	Very Little

Table 6 presents the perceived competencies of the respondents before enrolling and after graduating in the program. As seen (Table 6), the respondents perceived that they have "Much" competencies except in research capability. However, after graduation, the respondents perceived competencies were increased to "Very Much". This only imply that respondents believed that enrolling and graduating to the program helped them improved their personalities as educators.

Subjects that are Useful to the Present Job of the Graduates

Another portion of this research was to find out how the respondents find the extent of usefulness of the MAME program (Table 7). The researcher used a checklist in all the subject offerings of the program and let the respondents checked all the taken subjects they feel to be very useful in their present job/career.

It was found out that all the respondents believed that their enrolled major (30 or 100%), basic (30 or 100.00%) and theses writing (30 or 100.00%) subjects were very beneficial in their present jobs. It is also important to note that the cognates subjects specifically the Linear Algebra, and Probability and Statistics were found to be the most enrolled cognate's subjects of the respondents. Most of the respondents chosen Linear Algebra (29 or 96.67%) and majority finds Probability and Statistics (22 or 73.33%) to be beneficial in their present careers.

Table 7. Usefulness of the MAME Subjects in Present Job of the Respondents

Subjects*	**f**	**%**
Basic		
Math 201- Foundations of Mathematics	30	100.00
RS 299a- Statistics in Research	30	100.00
RS 299b- Research Methodology	30	100.00
Major		
Math 202- Algebra and Trigonometry for Teachers I	30	100.00
Math 203- Algebra and Trigonometry for Teachers II	30	100.00
Math 204- Geometry for Teachers	30	100.00
Math 205- Analysis I	30	100.00
Math 206- Abstract Algebra	30	100.00
Math 207- Analysis II	30	100.00
Cognates		
Math 208- Linear Algebra	29	96.67
Math 209- Probability and Statistics	22	73.33
Math 210- Intro. To Computer Programming	6	20.00
Mgt 244- Human Behaviour in Organization	16	53.33
Mgt 241- Program/Project Development & Management	5	16.67
IT 200- Seminar in Computer Education	17	56.67
Thesis Writing		
RS 299c- Thesis Writing	30	100.00

*Multiple Response

Level of Personal and Professional Contribution of the MAME Program to the Graduates

Looking at Table 8, the participants perceived a "Very High" ($\bar{x}$= 4.59) contribution of the MAME program in their personal and professional growth.

Table 8. Perceived Contribution of the MAME Program to the Personal and Professional Growth of the Respondents

Personal and Professional Development	$\bar{x}$	**DR**
Academic Profession	4.80	Very High
Problem-Solving skills	4.77	Very High
Research Skills	4.67	Very High
Learning Efficacy	4.63	Very High
Communication/Interpersonal	4.63	Very High
Information Technology Skills	4.60	Very High

Team Spirit/People Skill		4.67	Very High
Local Community Involvement		4.47	Very High
International Community Engagement		4.13	High
Critical Thinking Skills		4.67	Very High
Salary and Promotion		4.77	Very High
Opportunity Abroad		4.13	High
Personality Development		4.77	Very High
	Overall	**4.59**	**Very High**

Legend: **Ranges**	**DR**
4.21 – 5.00	Very High
3.41 – 4.20	High
2.61 – 3.40	Fair
1.81 – 2.60	Low
1.00 – 1.80	Very Low

The items academic profession, problem solving skills, salary and promotion, and personality development got the highest mean ratings of 4.80, 4.77, 4.77 and 4.77, respectively, described as "Very High". This means that the program stimulates the vital skills for the personal and professional life of the graduates.

Meanwhile, the items international community engagement and opportunity both got a mean rating of 4.13, described as "High". This implies that the MAME program contributes to the holistic development and success of the students. The program helps the students manage their learning and growth to keep their knowledge up to date and ensuring them to work effectively.

Teachers who earn their advanced degrees show a deep level of understanding and commitment to the profession, allowing them to modify curriculum goals, adjust teaching methods, and enter leadership positions to enact the system-wide changes in education they wish to see (Masters in Education, N.D.)

Harris & Sass (2011) noted that graduate education improves teaching effectiveness. Moreover, Sahlberg (2015) stated that pursuing graduate studies elevates the status of the teaching profession.

Assessment of Graduates on the Features of the MAME Program

In table 9, the participants assessed the features of the MAME program as "Excellent" ($\bar{x}$= 4.45). It is significant to note that almost all the items are rated to be "Excellent" with mean ratings ranging from 4.27 to 4.73. This implies that various features of the program, like its relevance to students' professional requirements, professor's knowledge of the subjects, problem solving, and many others, are essential for academic integration as perceived by the participants.

Table 9. Assessment of Graduates on the Features of the MAME Program

Value of the MAME Program	$\bar{x}$	DR
Range of Subjects Offered	4.57	Excellent
Relevance of the program to your professional requirements	4.73	Excellent
Extra-Curricular Activities	4.13	Very Good
Problem Solving	4.63	Excellent
Premium Given to Research	4.37	Excellent
Interdisciplinary learning	4.37	Excellent
Teaching and learning Environment	4.57	Excellent
Quality of Instruction	4.60	Excellent
Teacher- Student Relationship	4.57	Excellent
Library Resources	4.27	Excellent

Laboratory Resources		3.90	Very Good
Class Size		4.60	Excellent
Infrastructure and facilities		4.27	Excellent
Professor's knowledge of major subjects		4.73	Excellent
	Overall	**4.45**	**Excellent**

Legend:

Ranges	**DR**
4.21 – 5.00	Excellent
3.41 – 4.20	Very Good
2.61 – 3.40	Good
1.81 – 2.60	Poor
1.00 – 1.80	Needs Improvement

It is significant to note that the items "Relevance of the program to your professional requirements" and "Problem Solving" got the highest mean rating of 4.73 and 4.60, respectively, described as "Excellent". The participants appreciated the importance of the program in developing their professional growth and having good problem-solving skills.

However, the items Extra-Curricular Activities and Laboratory Resources got the lowest mean ratings of 4.13 and 3.90, respectively, described as "Very Good". This means that the participants assessed these features to be less likely encountered in the duration of the course.

According to Tinto's model, as cited by Severiens & Schmidt (2008), institutional experience has an impact to social and academic integration of the students. Students are more inclined to persist in their studies when they participate both within and outside the context of their learning environment, take part in extra-curricular activities, and feel connected with teachers and classmates.

Overall Contribution of the MAME Program to the Graduates

Quantitative content analysis was also employed to analyze the responses of the respondents in two open-ended questions namely: (1) how does the MAME program helps you? (2) What suggestions can you give to improve the MAME program?

The unit of analysis used were words and phrases taken from the respondents. The frequency of occurrence of words were counted. This is to identify the patterns and array of themes that emerged based from the responses. The themes were determined by the researchers through a consensus of opinions. They also consulted experts to determine the reliability of the coding keys. The interview data were then grouped and interpreted.

Table 10 lists the roles of the MAME program, which emerged from the answers of the respondents on how it helped or contributed to their present status.

Indeed, the MAME program has helped the respondents in various ways. Four themes emerged as common answers of the respondents. These include enhanced teaching capability, professional growth, advancement of mathematical proficiency, and employment and promotion.

Table 10. The contributions of the MAME Program to the respondents' present status

Themes	**f**
1. Enhanced Teaching Capability	10
2. Professional Growth	7
3. Advancement of Mathematics Proficiency	5
4. Employment and Promotion	5

**3 respondents have no answers*

Role 1: Enhanced Teaching Capability

As affirmed by Zeichner & Conklin (2005), enhancing teachers' competence has been the focus in the offering of various teacher education and professional advancement over the past decades. Nine respondents believe that their teaching capability has been enhanced after graduating from the MAME program. Some of their responses are the following:

"It helped me a lot especially on my teaching. I am applying some learning in teaching Mathematics especially the different strategies and techniques in solving math problems."

"It helps me learn new things and new techniques in solving mathematical problems. It widens my knowledge about mathematics education."

Role 2: Professional Growth

The quality of teaching is a function of the quality of the teacher—typically understood as academic credentials, sometimes with dispositions and personality traits also considered (Bowles, Hattie, Dinham, Scull, & Clinton, 2014). The respondents realize professional growth after obtaining their MAME degree. Some of these evidence are shown in the following:

"The program helps me to be a better version of me as a person and as a teacher because of the offered subjects, but most of all it is because of the professors who passionately help their students."

"*It has contributed greatly to my professional goal of becoming an effective educator."*

Role 3: Advancement of Mathematics Proficiency

The MAME program has also helped the respondents in advancing their content knowledge in mathematics to demonstrate their mathematics proficiency as teachers. In England, Burghes and Geach (2011, p. 17) reported: "A prerequisite to be an effective teacher of mathematics, is that you are confident and competent in mathematics at a level significantly above that which you are teaching." This is somehow, one of the purposes why the students enrolled in the program to advance their knowledge in mathematics. Two respondents affirmed this in the following statements:

"It expands my knowledge on my field of specialization."

"In depth knowledge and appropriate application of math concepts."

In England, Burghes and Geach (2011, p. 17) reported, ''A prerequisite to be an effective teacher of mathematics, is that you are confident and competent in mathematics at a level significantly above that which you are teaching.''

Role 4: Employment and Promotion

One of the reasons of gaining a master's degree is for employment and promotion. Five of the respondents explicitly indicated that after graduating in the MAME program, they were promoted to higher ranks.

Suggestions of the Graduates on the Program

Table 11. Suggestions to improve the MAME program.

Themes	f
1. Quality Instruction	10
2. Continue Extension Activities	3
3. Improvement of Resources	3
No Suggestion	14

Some of the suggestions revolved around on three themes namely: quality instruction, continue extension activities, and improvement of resources (Table 11).

Suggestion 1: Quality Instruction

The most common suggestion from among the respondent is to improve the quality of instruction in the program. Eight respondents highlighted areas in instruction that need to be improved. Some of these include continuous upgrading of pedagogical skills among the professors and instructors and the use of modern technology in teaching. One respondent emphasized that to have quality instruction:

> "*I think the continuous upgrading of pedagogical skills among the professors and instructors is one of the ways to improve the program.*"

Suggestion 2: Continue Extension Activities

Four respondents suggested to continue extension activities being conducted by the program. This is in adherence to Commission on Higher Education's (CHED) Memorandum on the Enhanced Policies and Guidelines on Student Affairs and Services. The CHED Memo states that Higher Education Institutions should be able to contribute positively to the progress of the country and to uplift human conditions. It must provide a set of student-centered activities and services in support of academic instruction intended to facilitate holistic and well-rounded student development for active involvement as future responsible citizens and leaders. Two respondents mentioned:

> *"The extension program of MAME must be continuous."*
>
> *"Strengthen research capability of the students and sustainability of community service (the idea here is to serve the community)."*

Suggestion 3: Improvement of Resources

Three respondents stressed the need to improve the instructional resources for the program.

> *"Offer other subjects to the secondary teachers which enhances their capability to teach secondary teachers. Ex. Mobile apps that can be used to teach math."*

Based on this, the respondent is concerned with the opportunity to enhance her capability in teaching with the use of technology such as mobile apps that she may use for teaching her math subjects in the secondary level.

On the other hand, as reflected in the table, almost half (14 out of 30) of the respondents have not provided their suggestions. Some of them have mentioned that they cannot think of other suggestions on how to improve the program because they believe that the program has been doing well. One respondent stated as follows:

> "*I just want to say thank you to my professors in MAME. Continue doing your excellent performance.*"

CONCLUSIONS

Based on the findings of the study, the following are concluded:

1. The MAME graduates are mostly young, either single or married and possessed an eligibility.

2. The MAME graduates were an alumnus of mathematics-related courses in their undergraduate studies, have enrolled their master's degree within four years after graduation and completed the MAME program within the prescribed number of years.
3. Having a master's degree greatly contributed to settling a permanent teaching job in public schools.
4. Professional and personal growth and development is the strongest drive to pursue advance studies.
5. The MAME program enhanced the different job-related competencies of the graduates.
6. Subject offerings under the Basic and Major Subjects of the MAME Program were useful to the graduates. However, non-mathematics subjects under the Cognates were not beneficial to the graduates.
7. The MAME program has contributed greatly to the academic profession of the graduates.
8. The MAME program has many excellent features, yet only very good along extra-curricular activities and laboratory resources.
9. The MAME program contribute to the holistic development of the graduates.
10. Feedbacks from the MAME graduates are essential in the continuous improvement of the program.

RECOMMENDATIONS

The following recommendations are forwarded:

1. Those who would like to have a permanent and/or higher rank in public schools should pursue their graduate studies.
2. The curriculum planners should examine the subject offerings under the Cognates Subjects of the MAME program specifically that of the non-mathematics subjects. They may replace these subjects into mathematics related subjects which are more beneficial to the students.
3. Administrators may consider some improvement of the laboratory resources of the program and also involve graduate students in extra-curricular activities.
4. The feedbacks from the graduates may be considered as a key input in crafting a development plan for the program.
5. A regular conduct of tracer studies on the program in order to monitor the impact of the program to its graduates.

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