

Tracer Study on the Master of Science in Teaching Physics Graduates

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ABSTRACT

Academic institutions aim to produce competent and highly qualified graduates who can compete locally and globally. A tracer study is an important way of determining graduates' employment status, which may serve as a basis to ascertain the relevance and effectiveness of a program. This study aimed to trace the Master of Science in Teaching Physics (MST Physics) graduates of the University of Northern Philippines from 1989 to 2019. Specifically, it sought to determine the academic profile of the graduates, their productivity, competencies learned that are useful in their current job, assessment of the graduates as to the attainment of the program outcomes, and suggestions and recommendations for the improvement of the program. Thirty-six graduates served as respondents. The instrument used was a modified Graduate Tracer Study Questionnaire of the Commission on Higher Education. Data were gathered online and analyzed using appropriate statistical tools. The MST Physics graduates are permanently employed and making significant contributions to educational institutions in Ilocos Region, neighboring regions, and other countries. They became more productive in their work and received promotions after finishing their degree. The graduates found critical thinking, problem-solving, and communication skills the most useful competencies in their employment. They claimed that all the program outcomes were very highly attained. The graduates, however, suggested a continuous improvement of the curriculum and instruction, acquiring more equipment, and conducting more co-curricular activities like seminars and training for the students.

Keywords: Curriculum enhancement, Employment, Graduate competencies, Professional development

INTRODUCTION

Every academic institution aims to produce competent and highly qualified graduates who can compete locally and globally. The best indicator that determines the contribution and effectiveness of a curricular program is the kind of graduates it produces. The graduates' success in gaining and maintaining employment mirrors the quality of instruction, training, and preparation they have received in school, whether these have been sufficient and relevant.

Since the quality of degree programs, and the educational institutions as a whole, are mirrored by the quality of their graduates, administrators and teachers ought to work together to ensure that their students receive the best instruction and training to prepare them for their future careers. Such collaboration also involves following up where these graduates go after leaving the school, and determining their success and difficulties, in

finding work through alumni tracer studies. The Commission on Higher Education (CHED) has realized the importance of tracing the graduates of colleges and universities in the Philippines. Hence, it has initiated a Graduate Tracer Study (GTS) to determine graduates' employability across disciplines and identify employability problems.

Tracer studies according to Schomburg (2003) as stated by Pardo et al. (2019) allow higher education institution to acquire valuable evidence for its improvement, gauge its relevance, contribute to the accreditation process, and to inform stakeholders about its accomplishments. Tracing graduates is a CHED mandate in its NHERA 2 because it provides evidence of the quality of education delivered as well as other issues that could be associated on the institution itself.

Tracer surveys are also studies that gather feedback from graduates of an educational institution to monitor their achievements and progress in their careers and give policymakers vital information on critical issues (Mubuuke, Businge, & Kiguli-Malwadde, 2014). With an alumni tracer study, schools will be able to identify their graduates' job careers – what they do, where they work, how related are their works to the degree programs earned, how much they earn, and how long did they have to wait before they were able to land on their first jobs. The graduates' difficulties in finding and maintaining jobs are also determined to help curriculum designers and administrators improve their curricular programs and their actual delivery and implementation.

Nowadays, the labor market dictates the competencies and skills that the workforce needs to have. Thus, the universities are challenged to provide the necessary training, knowledge, and skills that future graduates should have to conquer the world of work.

Tracer studies for graduates are reliable tools that universities can use to determine the quality of their graduates and the extent of functionality of the services they offer to their graduates, in other words to determine whether their graduates possess the competencies and the skills needed by the labor market. Tracer studies provide a basis for the institutions to improve the content and delivery of their educational services. Also, tracer studies provide information on the extent to which the university's vision, mission, goals, program objectives, and students' learning outcomes have been realized. (Tanhueco-Tumapon, 2016).

In the tracer study conducted by Cuadra, Aure, and Gonzaga (2019), findings showed that graduates were able to find a job through someone they knew, and most of them have jobs relevant to their degree programs. Their study also found out that one of the significant strengths of the curriculum is the relevance of the degree program to professional requirements. On the contrary, some areas need improvement, which includes student mobility, credit transfers, quality assurance, and research clusters for the universities to cope with the standards of the ASEAN higher education system.

In another tracer study for the graduates of a premier teacher education university in the Philippines (Gines, 2014), the effectiveness, adequacy and relevance of the curriculum were determined in responding to the changes in global educational trends as results of emerging developments such as the international standards in academic programs, the ASEAN Integration, the Competency Framework of South East Asian (SEA) Teachers in the 21st Century, and others.

One curricular program offered by the university in the College of Teacher Education (CTE) is the Master of Science in Teaching Physics (MST Physics). The MST Physics program is a post-graduate degree for teachers, teaching physics in the tertiary and secondary levels, and natural science researchers holding positions in public and private agencies.

The Master of Science in Teaching Physics Program of the College of Teacher Education aims to train students to understand and appreciate the natural world. It is also aimed at developing the quantitative skills of the students. The program is also designed to equip students with the necessary skills and knowledge to prepare them for further academic studies.

The MST Physics/Chemistry program curriculum was patterned after the MST program of the De La Salle University, where the first faculty members of the UNP MST Physics/Chemistry program finished their master's degrees. As of this time, the Commission on Higher Education has not issued a memorandum order that would otherwise set the minimum requirements for the MST program. The basis, therefore, in setting the number of units of the subject offerings has been the PSG for graduate programs, the latest version of which is CMO No. 15, s. 2019.

In 2014, the university implemented the vertical articulation of the offerings of the Graduate School. Since then, the program has been offered at the College of Teacher Education - Graduate Studies.

Through this alumni tracer study, the employment profile of the MST Physics graduates of the University of Northern Philippines was ascertained to know whether or not the graduates' careers correspond to the expectations of CHED and the workforce. This study also sought to determine the personal and educational background of the graduates and their employment profiles.

Objectives of the Study

This study aimed to trace the Master of Science in Teaching Physics (MST Physics) graduates of the University of Northern Philippines from 1989 to 2019. Specifically, it sought to determine the following: a) academic profile of the graduates; b) their productivity; c) competencies learned that are useful in their current job, d) assessment of the graduates as to the attainment of the program outcomes; and e) suggestions and recommendations for the improvement of the program.

Theoretical Underpinnings of the Study

The study is anchored on the Curriculum Theory of John Dewey, the Neoclassical Keynesian Theory, and the Human Capital Theory.

According to John Dewey, the curriculum should eventually develop pupils capable of dealing effectively with the modern world. As a result, curricula should not be presented as final abstractions but should consider the child's preconceptions and how they see the world. To define how to classify children's conduct, Dewey employs four instincts or impulses. According to Dewey, the four impulses are social, productive, expressive, and artistic. The curriculum should help the child develop an organized understanding of their world. Dewey sought to connect smaller versions of basic life activities in the classroom by

using professions. Dewey planned to achieve this goal by combining topic areas and materials. (Simpson et al., 2013).

The Neoclassical Keynesian Theory explains unemployment as a temporary problem resulting from inflation. This theory views that lowering inflation would stabilize the economy, resulting in economic growth and, as a result, a decrease in unemployment. This theory also applies the idea of supply and demand to its analysis of the labor market, treating unemployment as a state of disequilibrium resulting from the persistence and consistency of wages at a higher level than that which clears the labor market. Minimum wage legislation, union bargaining, and efficiency wages (where higher salaries produce better workers from the employment pool) are only a few reasons why the labor market cannot adjust to maximum capacity (Palmiano, 2019).

The Human Capital Theory recognizes the link between investments in human development and economic growth and development. According to this notion, the government and its citizens should consider investing in higher education on both a public and private level. The central claim is that, as a public investment, putting money into education promotes economic growth by boosting productivity, fostering social stability, and promoting healthier lifestyles. On the other side, investing in education as a private investment option results in higher lifetime earnings, lower unemployment, better-paying jobs, and a quicker and more seamless transfer to an improved (Maringe, 2015). This theory also asserts strong empirical evidence of an inverse association between unemployment and educational attainment, suggesting that unemployment rates will undoubtedly drop as educational attainment advances (Palmiano, 2019).

METHODOLOGY

This research employed a quantitative research design utilizing the descriptive survey method of research to characterize the graduates in terms of personal, academic, and employment factors and their assessment on how well the objectives of the MST Program were attained and recommendations to improve the Program.

The population of this research comprised all the MST Physics graduates of the University of Northern Philippines from 1989 to 2019. Due to the nature of the program, there were only very few graduates. There were years when there were no graduates of the Program. Hence, only 36 finished the program in 30 years in this study. The graduates are predominantly female, married, residing in rural areas in the Province of Ilocos Sur.

The Graduate Tracer Study (GTS) questionnaire made by CHED was used in this study. The researchers made slight modifications to the CHED instrument to suit the needs of the study. Documents from the Registrar's Office were used to determine the number of graduates per year.

Due to the pandemic, data were gathered online thru social media platforms like messenger, Facebook, and emails. The descriptive statistics like frequency, percentage, and mean were used to analyze the data gathered in the study.

Participants of the research shall be the priority of this research undertaking. Ethics, therefore, was observed before, during, and after the conduct of the study. Informed

consent was obtained to allow the participants to have an overview of the purpose, processes, timeframe, benefits, and risks of this research undertaking. Respondents may withdraw at any time, even before the study is completed. All information shared by the participants was treated with respect and confidentiality.

RESULTS AND DISCUSSION

Academic Profile of the Graduates

The academic attributes of the graduates are reflected from the undergraduate degree, the college or university where they finished their undergraduate education, and the honors they received before entering the MST Physics Program. The distribution of the graduates based on the forecited variables is summarized in Table 1.

Table 1

Distribution of the Graduates in Terms of Academic -Related Factors

Educational Background	f	%
Degree(s) & Specialization(s)		
Bachelor of Science in Physics	1	41.66
Bachelor of Secondary Education Major in Physical Sciences	1	36.11
Bachelor in Secondary Education Gen. Science	5	13.89
Bachelor in Secondary Education Gen. Science/Math	1	2.78
Bachelor of Science in Chemical Engineering	1	2.78
Bachelor of Science in Civil Engineering	1	2.78
Total	3	100.0
College/University		
University of Northern Philippines	3	91.66
Ilocos Sur Polytechnic State College Sta Maria Cam	1	2.78
Technological Institute of the Philippines	1	2.78
University of Nueva Caceres	1	2.78
Total	3	100.0
Honor(s) or Award(s) Received		
Cum Laude	1	38.89
Diligence in Study	1	2.78
With Distinction	1	2.78
With Honors	1	2.78
None	1	52.77
Total	3	100.0

Almost half of the graduates entered the MST Physics program, carrying a specialized course, a BS Physics degree. More than one-third of the graduates have finished college degree in Bachelor of Secondary Education major in Physical Sciences. Only a few are graduates of the other bachelor in secondary education degrees. There are also engineering graduates who tried their luck in the MST Physics Program. The above data reveal that the

MST Physics graduates were equally prepared when they entered the program. All their courses in college are related to the graduate program. All the undergraduate degrees they obtained before enrollment in the MST Physics Program all dealt with Physics-related and mathematics topics which are essential skills required of the program.

Reasons for Enrolling the MST Program

When the graduates were asked why they enrolled in the MST Physics program, they gave varied responses, as reflected in Table 2. The majority of them divulged that they enrolled in the program because of career advancement. This implies that the graduates were very much interested in one's professional development. This shows that their career growth was their prime concern. More than one-half of the respondents claimed that MST Program is the course that is available and is vertically aligned to the university of their choice. Since the respondents are working while pursuing their advanced studies, as much as possible, they would want to study in a university that is near their working place. Furthermore, only the University of Northern Philippines offers the MST Physics Program in Region 1. In Manila, only De La Salle University is offering the program.

The table further shows that strong passion for the teaching of Physics is a reason given by some of the respondents. This study considers this a significant finding. The respondents showed their dedication to learning how to teach Physics to their students effectively. Physics is considered one of the complex subjects to teach because of the abstractness of the topics and the mathematical rigors needed to understand the concepts thoroughly. Redish (1994) stated that the reason why students describe physics as difficult is that it requires them to use different ways of understanding and to translate from one representation to another, from words to numbers to graphs to equations, diagrams and others. Furthermore, in a paper presented at the Australian Association for Research in Education (AARE) Annual conference in Brisbane in 2008, Fillmore, C and Tuovinen, J. used the Cognitive Load.

Table 2

Reasons for Enrolling MST Physics in the University

Reasons	f	%
Prospect of career advancement	20	64.52
Availability of course offering in the chosen institution	17	54.84
Strong passion for the profession	14	45.16
Peer Influence	13	41.94
Status or prestige of the profession	12	38.71
Inspired by a role model	11	35.48
Prospect for immediate employment	10	32.26
Affordable for the family	9	29.03
Good grades in high school	6	19.35
Prospect of attractive compensation	6	19.35
Influence of parents or relatives	4	12.90

Theory (Sweller, 2011) to explain why Physics is so hard to learn and propose an instructional material to assist students to cope with the innate complexity of Physics. Some of the respondents were also influenced by their peers. This may be because there are only very few teachers teaching Physics who had specialized in the subject. The secondary schools in the province and the region need Physics teachers to teach the subject. Their principals and peers could have challenged and convinced the respondents to enroll in the program. This may be the exact reason why some of the respondents also claimed that they are attracted to their status or the prestige of the profession. In the province, the MST Physics graduates usually act as trainers and resource persons in varied training and seminars in Science. These graduates have been acting as role models to the science teachers in secondary and tertiary schools. This may be why some respondents averred that a role model inspires them. Prospect for immediate employment is also a reason given by some respondents. Due to the shortage of qualified Physics teachers (Bernido, 2012) in the province and the region, and the whole country, a graduate in a Physics degree, has an advantage when applying for a teaching job, especially in the senior high school. This shortage of physics teachers is also felt in other countries. In the US, the American Physical Society has initiated the Physics Teacher Education Program, which is “meant to increase the supply and diversity of physics teachers with special credential program.” (Carr, 2019).

Other reasons given by a few of the respondents include affordability, good grades, and attractive compensation. Compensation as the reason for a limited number of the respondents implies that they consider passion for the profession more important than the material gain they will give after finishing the degree.

Employment Profile of the Graduates

Table 3 presents the employment profile of the graduates of the MST Physics Program. It is noteworthy that all the graduates of the program are currently employed. Almost all of them are currently working in government institutions and offices. Most of the graduates in the program are employed in academic institutions as teachers in secondary schools, as Physics teachers in junior and senior high schools, and in higher education institutions as professors. All of them hold a permanent status. This suggests that MST Physics is an attractive program with promising employment. It is indeed one of the immediate needs of the teaching profession in both the secondary and tertiary levels of education. The majority of the graduates have been employed for quite a long time already, more than five years. Most of them have stayed in their workplaces for 6-10 years. Some have been employed for more than 15 years already. These are the graduates during the early years of the program, the role models who inspired the younger graduates to enroll in the program.

Table 3
Employment Profile of the MST Physics Graduates

Employment Profile	f	%
Employment		
Currently Employed	36	100.00
Total	36	100.00
Type of Organization/Employer		
Private	2	5.66
Public/Government	34	94.34
Total	36	100.00
Status		
Permanent	36	100.00
Total	36	100.00
Number of Years in the Workplace		
25 and above	2	5.55
21 – 25	2	5.55
16 – 20	4	11.11
11 – 15	4	11.11
6 – 10	16	44.44
1 – 5	8	22.22
Total	36	100.00
Place of Work		
Abroad	4	11.11
Local	32	88.89
Total	36	100.00
Monthly Income from Present Employment		
10,000-20,000	4	11.11
21,000-30,000	11	30.56
31,000-40,000	10	27.88
41,000-50,000	2	5.55
51,000-60,000	1	2.78
61,000-70,000	1	2.78
71,000 and above	7	19.44
Total	36	100.00
Working while pursuing MST Physics		
Yes	36	100.00
Immediate movement in employment status and/or rank after finishing the MST Physics program		
No	8	22.22
Yes	28	77.78
Total	36	100.0
Movement in employment status and/or rank after finishing the MST Physics program		
Promotion	34	94.44
No Movement	2	5.56
Total	36	100.00
Current job related to the graduate program MST Physics		
No	2	5.56
Yes	34	94.44
Total	36	100.0

The majority of the graduates serve the country, serving academic institutions in the region and nearby regions. The graduates of the MST Physics Program are also serving other

countries in the world. Four of the graduates are employed in the United States of America, also as teachers in Physics. This is proof that the MST Physics Program also produces globally competitive graduates. The graduates employed abroad are doing great in their workplaces. Some of them even occupy administrative positions.

As to monthly income, most graduates receive a monthly salary within 21,000 to 30,000. However, more than one-half of them receive more than 30,000 pesos monthly. One-fourth of them receive more than 50,000 pesos monthly. This is expected because the majority of them work as teachers in academic institutions with standard compensation schemes. The monthly salary of the teachers reflects the salary grade of the graduates. Therefore, the salary distribution indicates that most of the graduates hold Teacher 1 to 3 for those at the DepEd and Instructor 1 to Instructor 2 for those at the higher education institution. The salary distribution also indicates that there are graduates who occupy salary grade 19 and above equivalent to a position of Master Teacher at DepEd and Associate Professor and higher. These salary grades are already high as far as teaching positions are concerned.

This study also found that the graduates finished their MST Physics degree while working. This may sound too difficult, but the graduates were able to do it and finished the degree on time without delays. This manifests their passion and dedication to advance their career for their professional growth and development. Regarding promotion, a great majority of the graduates received immediate movement in their employment status and salary rank after finishing their MST Physics degree. At higher education institutions, a master's degree is a requirement for a permanent position which is considered a promotion from either a contractual or part-time position. At the DepEd, those who graduate in MST Physics are usually assigned to teach at the Senior High School, which is equivalent to a promotion. However, few did not receive immediate promotion after finishing the degree but later were given promotions. Although not all were given promotions, generally, all the graduates got promotions after completing their MST Physics degree.

Regarding the relevance of the program, all the graduates except two who preferred to do office work averred that their present work is related to the degree they earned. This implies that the MST Physics Program is relevant to the needs of the time.

Competencies Learned Useful in Current Job

In this study, the graduates were also asked what competencies they consider useful in their present work. The responses of the graduates are summarized in Table 4.

Table 4

Competencies Learned Useful in Current Job

Competencies	f	%
Critical Thinking Skills	27	87.10
Problem-Solving Skills	25	80.65
Communication Skills	21	67.74
Information Technology Skills	11	35.48
Human Relations Skills	9	29.03
Entrepreneurial Skills	1	3.23

Most of the respondents indicated that critical thinking skills (87.10%), problem-solving skills (80.65%), and communication skills (67.74%) were the most useful competencies learned from the MST Physics program in their current employment.

According to the Editorial Team of indeed.com, a career-advising site, "Critical thinking is the ability to objectively analyze information and draw rational conclusions." As such, critical thinking involves the ability to discern relevant information by deductive reasoning and to analyze, understand and interpret these data, and coming up with conclusions (Indeed Editorial Team, 2021). Critical thinking skills are a plus factor for a teacher. These are the traits that education supervisors are looking for. Physics laboratory subjects are specifically mentioned by Holmes (2015) to develop critical thinking skills. In the context of a physics laboratory class, critical thinking refers to the ability to "critique data, to identify whether or not conclusions are supported by evidence, and to distinguish a significant effect from random noise and variability."

The MST Physics students are exposed to different types of activities and tasks inside and outside the classroom to develop critical thinking skills. In a typical classroom discussion, specifically in major subjects, the professor would present an instance of a physical system then pose conceptual questions that elicit deep analysis. Since most MST students are high school teachers, they are tasked to conduct simple action research. Their students and the actual classroom situations become the focus of the action research. In the subject Instrumentation, they are required to improvise an apparatus, design an experiment and present everything in the class. These strategies are geared to develop critical thinking skills among MST Physics students.

In the workplace, problem-solving skills refer to handling and assessing difficult or unexpected situations and looking for solutions (Indeed Editorial Team, 2020). Problem-solving skills are not limited to solving physics and mathematics problems, but this is equally important to increase the knowledge and expertise of the teachers along with Physics. In the context of a physics class, an effective problem solving begins with a qualitative analysis of the problem, followed by planning, implementation, assessment, and reflection (Heller et al, 1992). In addition to giving the students seat works and problem sets to solve, the strategies mentioned above like conducting action research, improvisation, doing experiments are also geared to develop problem-solving skills.

Communication skills are the abilities to give and receive different kinds of information that include volume, clarity, empathy, respect, and understanding nonverbal cues. These skills are used to communicate ideas, feelings, tasks, and events. These skills may be verbal, nonverbal, visual, or written (Indeed Editorial Team, 2020). In the context of any technical or scientific field, communication skills refer to the ability to conform with the internationally accepted principles of the scientific style with the following features of being universal, exact, brief, and logical. These features are manifested in exact and clear presentations of scientific materials, easily understandable to others (Klochkova, 2016).

To develop communication skills among the MST students, they are often given tasks to present topics in the class, whether in major subjects, cognates, or electives. In this way, they gain more confidence and become more eloquent. In giving their presentations, they always use multimedia gadgets, and they get to explore and use different IT

applications, including computer simulations for physics concepts. This way, they also get to develop their IT skills. In the subject History and Philosophy of Science, they must answer many essay types of questions and write reaction papers and reflections. A class debate is also conducted. These strategies are all aimed to develop verbal, nonverbal, visual, and written communication skills among MST Physics students.

Attainment of Program Outcomes

Likewise, the graduates were asked to evaluate the level of attainment of the program outcomes of the MST Physics program. The graduates were asked to evaluate the expected program outcomes based on their experiences in their current work. (Please refer to Table 5.)

Generally, the graduates gave a very high assessment of the attainment of the program outcomes. The program produced Physics teachers who can effectively and efficiently deliver instructional services at the secondary and tertiary levels. This is because of their exposure to different Physics content areas, which they did not learn in-depth in college. Their misconceptions may have been corrected; hence, they gain more confidence in teaching the subject. Because of the exposure of the graduates in research as embedded in the different subjects offered in the program and the varied opportunities given to them to develop their research competencies, they became highly competent researchers in science education, particularly in Physics.

The presence of a subject in the teaching of Physics has made the graduates more adept at varied approaches, trends, and methodologies in teaching Physics. They better understood current theories, research, and practices in Physics and other related science subjects.

Table 5

Level of Attainment of Program Outcomes of the MST Physics Program

Program Outcomes	Mean	DR
1. Highly qualified teachers of Physics both in tertiary and secondary levels;	3.89	Very High
2. Highly competent researchers in the fields of Physics and science education;	3.64	Very High
3. Exposed to new approaches and trends in teaching Physics;	3.71	Very High
4. Abreast of the current trends in theory, research, and practices relevant to Physics and other related science courses;	3.64	Very High
5. Able to provide the students with deeper insights into the meaning and the structure of the sciences and their interdependence with other disciplines;	3.85	Very High
6. Able to practice moral and scientific values in the acquisition of concepts in Physics.	3.89	Very High
Overall	3.77	Very High

Suggestions for the Improvement of the MST Physics Program

The suggestions proposed by the respondents revolved around three themes, namely: curriculum and instruction, facilities, and co-curricular activities.

The most common suggestion of the respondents is to improve the quality of the curriculum and instruction of the program. This includes the continuous upgrading of pedagogical approaches of the professors and the inclusion of modern technology in teaching. These suggestions are like the views presented by Cheng Tan and French-Arnold (2015) on the employability of graduates in Asia that the global economy favors knowledge and technology, which implies that a relevant higher educational system is critical for preparing a competent workforce. One of the critical functions of a teacher, along with imparting wisdom and developing the skills of their students, is to ascertain how effectively they have achieved the knowledge, skills, and attitudes inherent in the lessons. Teachers must employ efficient approaches to measure, assess, and evaluate student learning successfully. (Kalaw, 2016). A viewpoint supported by Aquino et al. (2014) emphasized the importance of enhancing faculty competence and effective teaching strategies to provide the students with relevant and practical training.

The respondents' suggestions regarding facilities focused on upgrading the laboratory equipment and apparatus for them to use.

The graduates also recommended that the university provide more seminars or training to have creative minds and be critical thinkers and problem- solvers.

CONCLUSIONS

The university has attained its goal to produce competent and highly qualified graduates who can compete locally and globally. This is manifested by the very high percentage of MST Physics graduates who are employed and holding permanent positions in educational institutions in the Ilocos Region, neighboring regions, and other countries. The MST Physics program that the respondents pursued helped improve their skills and employment status. These are manifested by the high percentage of respondents who considered their graduate course highly relevant to their current jobs. Also, the respondents indicated that the skills they learned are helpful in their jobs' performance. As a result, they were promoted after finishing the program. The graduates are generally satisfied with the delivery of the program, as evinced by the very high rating on the attainment of program outcomes. Furthermore, the graduates believe that the program could be improved by considering revisions in the curriculum and instruction, upgrading facilities, and providing training and seminars as co-curricular activities.

RECOMMENDATIONS

Based on the findings and conclusions, it is recommended that the UNP-CTE should improve the curriculum and facilities relative to the MST Physics program. The faculty should continuously capacitate themselves to improve and align the curriculum based on the needs of the schools and learners.

ETHICAL STATEMENT

This study was reviewed and approved by the University of Northern Philippines Ethics Review Committee. Ethical principles observed in the study include the conflict of interest, principle of informed consent, principle of privacy and confidentiality, principle of vulnerability, recruitment, benefits, compensation, and community considerations.

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