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ENGAGEMENT AND ATTITUDINAL DISPOSITIONS TOWARDS PROFESSIONAL DEVELOPMENT AND THEIR RELATIONSHIP TO MATHEMATICS TEACHERS' PERFORMANCE

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Abstract

This study examined the level of engagement and attitudinal dispositions of mathematics teachers toward professional development and their relationship with teacher performance in secondary schools of Buguey District, Cagayan, for School Year 2025–2026. It also identified enabling and limiting factors affecting participation and served as the basis for a proposed intervention. Using a descriptive–correlational design, data were gathered from 60 respondents through a validated instrument and analyzed using descriptive and inferential statistics.

Findings revealed very high levels of engagement and very positive attitudes toward professional development, alongside outstanding performance ratings. However, no significant relationship was found between engagement, attitude, and performance. Only selected attitudinal dimensions influenced engagement, while participation was shaped by both enabling factors such as administrative support and accessibility, and limiting factors such as workload, time constraints, and funding. The study concludes that the main issue lies in the limited translation of engagement into practice, highlighting the need for sustained, contextualized, and institutionally supported professional development programs.

Keywords: professional development, teacher engagement, teacher attitude, teacher performance, mathematics education

INTRODUCTION

Mathematics education has been a persistent challenge, as shown by international assessments such as PISA and TIMSS (Organisation for Economic Cooperation and Development, 2023). The OECD reported that many countries, particularly low- and middle-income nations, struggle with mathematics proficiency, with nearly 70 percent of 10-year-olds unable to meet minimum

learning standards (World Bank, 2022). The UNESCO emphasizes that professional development for teachers is critical in addressing learning poverty, strengthening problem-solving skills, and aligning instruction with the demands of 21st-century education under Sustainable Development Goal 4 on Quality Education (UNESCO, 2022).

In the Philippines, mathematics performance remains consistently low, with Filipino learners ranking near the bottom in PISA 2018 and 2022 (OECD, 2019;

OECD, 2023). National reports from EDCOM II (2023) and the Department of Education highlight teacher quality, limited training opportunities, and inadequate resources as major factors affecting teachers' instructional performance, which consequently influence classroom effectiveness. While reforms such as the Philippine Professional Standards for Teachers and the MATATAG Agenda seek to strengthen continuous professional growth, participation and engagement in professional development programs remain uneven, particularly in rural and geographically isolated areas (DepEd, 2023).

In Region II, particularly in Cagayan Province, mathematics continues to be one of the least mastered subjects, with regional monitoring reports indicating persistent instructional challenges in secondary schools. Rural districts lag behind urban counterparts due to unequal access to professional development opportunities, instructional resources, and mentoring support. Mathematics teachers in remote municipalities often encounter difficulties attending training programs because of distance, transportation constraints, and heavy teaching loads. These conditions limit teachers' engagement in professional development activities and affect their motivation, perceived relevance of trainings, and application of newly learned strategies in classroom instruction (Villegas-Reimers, 2018).

In Buguey District, these challenges are more evident. Mathematics teachers encounter several problems related to their engagement in professional development programs, including difficulty attending trainings due to distance, limited transportation, lack of substitute teachers, and budgetary constraints. Others report the limited availability of relevant and contextualized mathematics trainings and the absence of sustained follow-up or mentoring after seminars. Overlapping teaching loads further discourage active participation in professional development initiatives. These persistent issues highlight the need to assess how the extent of participation and teachers' attitudinal dispositions toward professional development influence mathematics teachers' professional performance within the district.

Buguey District, a coastal municipality in Cagayan, exemplifies these issues at the local level. Secondary schools in the district face resource shortages, heavy teaching workloads, and limited institutional support for continuous professional learning. As a result, mathematics teachers encounter difficulties in strengthening instructional delivery, enhancing pedagogical strategies, and improving classroom practices essential to effective mathematics teaching. These conditions are reflected in teachers' performance in areas such as lesson planning, instructional implementation, assessment practices, and overall professional accountability as measured through established performance evaluation systems (DepEd, 2022).

This study is anchored in Human Capital Theory, which posits that investments in teacher training enhance professional productivity and performance (Becker, 1993), and Constructive Alignment Theory, which emphasizes coherence among instructional objectives, teaching strategies, and assessment practices (Biggs, 2014). The 21st Century Skills Framework further underscores the importance of critical thinking and problem-solving competencies that effective mathematics instruction must develop. However,

existing Philippine studies largely focus on learner achievement outcomes, leaving limited empirical evidence on how teachers' engagement and attitudinal dispositions toward professional development relate directly to their professional performance, particularly in rural secondary school contexts.

Examining the level of engagement and attitudinal dispositions of mathematics teachers toward professional development and their relationship to teachers' performance, this study aims to generate evidence that will guide educational practice and policy. The findings are expected to support teachers in enhancing instructional effectiveness, assist school administrators in designing responsive professional development programs, and inform policymakers in strengthening teacher development frameworks. Ultimately, improving mathematics teachers' professional performance through meaningful and sustained professional development is essential to advancing the quality of mathematics instruction in Buguey District.

Statement of the Problem

This study determined the level of engagement and the attitudinal dispositions of mathematics teachers toward professional development programs and examined their relationship to mathematics teachers' performance in secondary schools of Buguey District, Cagayan, for School Year 2025–2026.

Specifically, it sought answers to the following questions:

1. What is the profile of the mathematics teachers and learners in terms of:
 - a. Personal
 - b. Professional (highlight faculty development activities participated for the past 15 years)
2. What is the level of engagement of mathematics teachers in the professional development programs in terms of:
 - a. Participation frequency
 - b. Participation quality output
 - c. Commitment to continuous learning
 - d. Application of learned skills in the classroom
3. What is the attitude of mathematics teachers towards professional development programs in terms of:
 - a. Perceived relevance
 - b. Motivation to participate
 - c. Perceived benefits
 - d. Willingness to apply new learned strategies
4. What is the level of teacher performance in terms of their IPCR?
5. Is there a significant relationship between the:
 - a. Engagement of teachers in professional development and work performance
 - b. Attitude towards professional development and work performance
 - c. Engagement and attitude towards professional development programs
6. What are the enabling and limiting factors that affect the participation of mathematics teachers in professional development activities?
7. What policy recommendations can be proposed for a school-based intervention?

METHODOLOGY

This section presents the methodology of the study, including the research design, locale of the study, respondents, sampling

technique, research instruments, data gathering procedures, and ethical considerations. It provides a clear explanation of the systematic processes undertaken to ensure the validity, reliability, and rigor of the study in examining the variables under investigation.

Research Design

The study employed a mixed-methods sequential explanatory design, consisting of quantitative and qualitative phases. The quantitative phase used a descriptive–correlational approach to determine teachers’ profile, engagement in professional development, attitudinal dispositions, and work performance, and to examine relationships among these variables. The qualitative phase followed to explain and validate quantitative results by exploring factors influencing participation. This design provided a comprehensive understanding of the variables and supported evidence-based recommendations for improving professional development practices.

Locale of the Study

The study was conducted in Buguey District, Municipality of Buguey, Province of Cagayan, under the Department of Education Schools Division Office of Cagayan, Region II. The district comprised public secondary schools serving learners from both coastal and inland barangays and implementing the K to 12 Basic Education Curriculum.

Respondents/Participants and Sampling Technique

The respondents of this study were Mathematics teachers from five public secondary schools in Buguey District, Division of Cagayan, namely Pattao National High School–Main, Pattao National High School–Maddalero Extension, Licerio Antiporda Sr. National High School–Main, Dalaya Extension, and Sta. Isabel Annex. The total population was 70 teachers, from which a sample of 60 was determined using the Raosoft Sample Size Calculator at 95% confidence level and 5% margin of error. Stratified random sampling was used to ensure proportional representation per school, followed by simple random sampling within each stratum. Respondents were licensed Mathematics teachers with at least one year of experience and participation in relevant professional development activities, while newly hired, non-Mathematics teachers, and those on leave were excluded.

Research Instruments

The research instrument used in this study was a self-made survey questionnaire designed to measure Mathematics teachers’ engagement in professional development, their attitudinal dispositions, and their work performance in Buguey District, Cagayan, for SY 2025–2026. It consisted of six parts: teacher profile, engagement in professional development, attitudinal dispositions, work performance, enabling and limiting factors, and open-ended questions. Engagement and attitude were measured using four dimensions each with Likert-scale items, while performance was based on IPCRF records (Areas 1–3). The instrument underwent expert validation and pilot testing to ensure reliability and validity. It was anchored on DepEd standards, and both quantitative and qualitative data were used for analysis and intervention development.

Data Gathering Procedure

After approval of the research proposal, the researcher secured permissions from the Schools Division Superintendent of DepEd Cagayan, followed by endorsements from the District Supervisor and participating school heads in Buguey District. The self-made

questionnaire was validated by experts in mathematics education and research, then pilot-tested in a neighboring district to ensure reliability and clarity, with revisions made accordingly. Upon final approval, the researcher coordinated with school heads for the scheduled administration of surveys and explained the study to respondents, securing informed consent prior to participation. Questionnaires were personally administered to ensure clarity and completeness. Work performance data were obtained from official IPCRF records (Areas 1–3) with permission from school heads. All responses were checked, coded, and securely stored, ensuring confidentiality throughout the process. This systematic procedure ensured ethical, reliable data collection for analysis and intervention planning.

Data Analysis

The study employed descriptive, inferential, and qualitative analyses following a mixed-methods sequential explanatory design. Quantitative data were analyzed first to determine levels and relationships among variables, followed by qualitative analysis to explain and support findings. Statistical tests were conducted using appropriate software and interpreted at a 0.05 level of significance.

Quantitative Data Analysis

Descriptive statistical tools were used to address Statements of the Problem Nos. 1 to 4. Frequency counts and percentages were employed to describe the personal and professional profile of the Mathematics teacher respondents. Weighted mean and standard deviation were used to determine the level of engagement of Mathematics teachers in professional development programs and their attitudinal dispositions toward such programs across the identified dimensions. These measures provided a clear and systematic description of the respondents’ perceptions and experiences.

Weighted means were interpreted using a five-point Likert scale. For the Level of Engagement in Professional Development Programs, the following scale was applied:

Statistical Limits

- 4.20 to 5.00 – Very High Extent
- 3.40 to 4.19 – High Extent
- 2.60 to 3.39 – Moderate Extent
- 1.80 to 2.59 – Low Extent
- 1.00 to 1.79 – Very Low Extent

For the Attitudinal Dispositions toward Professional Development Programs, the interpretation guide was:

Statistical Limits

- 4.20 to 5.00 – Very Positive Attitude
- 3.40 to 4.19 – Positive Attitude
- 2.60 to 3.39 – Moderately Positive Attitude
- 1.80 to 2.59 – Slightly Positive Attitude
- 1.00 to 1.79 – Negative Attitude

Teacher work performance was analyzed using mean IPCRF scores in Areas 1–3. Pearson r determined relationships among engagement, attitudes, and performance at 0.05 significance level, with standard interpretation of correlation strength. For enabling and limiting factors, weighted mean and ranking were used to identify and prioritize key variables.

Qualitative Data Analysis

Qualitative data from open-ended questions were analyzed using thematic analysis. Responses were transcribed, coded, and organized into themes reflecting teachers' experiences and factors affecting professional development. These themes were used to validate and enrich quantitative results. Integration of findings supported interpretation and informed policy recommendations and training plan development.

Ethical Considerations

The study adhered to strict ethical standards to protect participants' rights, privacy, and well-being. Approval was obtained from Cagayan State University Aparri and the Schools Division Office of Cagayan, with coordination from district and school authorities. Participation was voluntary, with informed consent secured from all respondents. Confidentiality and anonymity were ensured through coded responses and secure data storage. IPCRF data were accessed with authorization, and ethical clearance was secured prior to data collection in compliance with institutional guidelines.

RESULTS AND DISCUSSION

This section presents, analyzes, and interprets the data gathered in the study in relation to the specific research questions. The results are organized according to the sequence of the problems posed, covering teachers' profile, level of engagement in professional development, attitudinal dispositions, work performance, relationships among variables, and enabling and limiting factors. Findings are supported with relevant literature to provide deeper explanation and context for the interpretation of results.

1. Profile of the Respondents

Teacher's Personal Profile

Table 1a. Frequency and percentage distribution of the teachers in terms of their Personal profile

Profile Variables	Frequency (n=60)	Percentage
Sex		
Male	24	40.00
Female	36	60.00
Age		
20–29	14	23.33
30–39	20	33.33
40–49	17	28.33
50–59	9	15.00
60-above years	0	0.00
Weighted Mean	38.00	
S.D.	10.05	
Highest Educational Attainment		
Bachelor's Degree	3	5.00
With Master's Units	18	30.00
Master's Degree	30	50.00

With Doctoral Units	4	6.67
Doctoral Degree	5	8.33

Table 1a presents the distribution of respondents in terms of sex, age, and highest educational attainment. In terms of sex, 36 or 60.00% are female while 24 or 40.00% are male, indicating that females comprise the majority of the respondents, although both sexes are represented. Regarding age, most respondents belong to the 30–39 age group with 20 or 33.33%, followed by 40–49 years old with 17 or 28.33%, and 20–29 years old with 14 or 23.33%. The smallest group is 50–59 years old with 9 or 15.00%, while no respondents fall under 60 years and above. The computed mean age is 38.00 with a standard deviation of 10.05, suggesting moderate variability. In terms of educational attainment, half of the respondents (30 or 50.00%) have completed a Master's Degree, while 30.00% have Master's units. A smaller proportion holds Bachelor's and Doctoral degrees or units. Overall, the respondents are mostly female, mid-career, and highly educated.

Teacher's Professional Profile

Table 1b. Frequency and percentage distribution of the teachers in terms of their Professional Profile

Profile Variables	Frequency (n=60)	Percentage
Length of Teaching Experience		
Less than 5 years	14	23.33
5–10 years	15	25.00
11–15 years	16	26.67
16–20 years	11	18.33
More than 20 years	4	6.67
Weighted Mean	10.89	
S.D.	6.61	
Current Position		
Teacher I	6	10.00
Teacher II	7	11.67
Teacher III	43	71.67
Master Teacher I	4	6.67
Master Teacher II	0	0.00
Number of Faculty Development Activities Attended in the Past 15 Years		
None	0	0.00
1–5	14	23.33
6–10	17	28.33
11–15	22	36.67
More than 15	7	11.67
Weighted Mean	9.83	
Types of Professional Development Activities		

Attended		
Seminars	9	15.00
Trainings	47	78.33
Workshops	4	6.67
Conferences	0	0.00
Online courses / webinars	0	0.00

Table 1a presents the distribution of respondents in terms of sex, age, and highest educational attainment. In terms of sex, 36 or 60.00% are female while 24 or 40.00% are male, showing that females constitute the majority of respondents. Regarding age, most belong to the 30–39 age group with 20 or 33.33%, followed by 40–49 years old with 17 or 28.33%, and 20–29 years old with 14 or 23.33%. The smallest group is 50–59 years old with 9 or 15.00%, and none are 60 years and above. The mean age is 38.00 with a standard deviation of 10.05, indicating moderate variation. In terms of educational attainment, 50.00% have completed a Master’s Degree, while 30.00% have Master’s units. A smaller proportion holds Bachelor’s and Doctoral degrees or units. Overall, the respondents are predominantly female, mid-career, and academically qualified, with most pursuing or completing graduate studies, reflecting a generally well-prepared teaching workforce.

2. Teacher’s Level of Engagement in the Professional Development Programs

Participation Frequency

Table 2a. Teacher’s level of engagement in the professional development programs in terms of Participation frequency

Statement	Weighted Mean	Descriptive Value
I regularly attend professional development programs related to Mathematics teaching.	4.85	Very High Extent
I participate in professional development activities offered at the school level.	4.92	Very High Extent
I attend district or division-level professional development programs when invited.	4.83	Very High Extent
I prioritize attending professional development programs despite my workload.	4.73	Very High Extent
I consistently join professional development activities during the school year.	4.62	Very High Extent
I attend professional development programs beyond those that are mandatory.	4.72	Very High Extent
I actively seek opportunities to participate in Mathematics	4.83	Very High Extent

related trainings and seminars.		
Category Mean	4.79	Very High Extent

Table 2a presents the weighted mean and interpretation of teachers’ engagement in professional development in terms of participation frequency. The overall weighted mean of 4.79, interpreted as Very High Extent, indicates that mathematics teachers are highly engaged in professional development activities. The highest-rated item, “I participate in school-level professional development activities,” obtained a weighted mean of 4.92, while the lowest, “I consistently join professional development activities during the school year,” registered 4.62, both still within the Very High Extent category.

These results suggest that teachers actively participate in accessible, school-based activities; however, sustaining consistent engagement throughout the year may be affected by workload and time constraints. This implies that while teachers value professional development, continuous participation remains challenging due to competing responsibilities. The findings are supported by Darling-Hammond et al. (2017), Kyndt et al. (2016), and Garet et al. (2016), who emphasized that sustained and frequent professional development enhances instructional practices and strengthens teachers’ pedagogical competence.

Participation Quality Output

Table 2b. Teacher’s level of engagement in the professional development programs in terms of Participation quality output

Statement	Weighted Mean	Descriptive Value
I actively participate in discussions during professional development activities.	4.72	Very High Extent
I complete all required outputs during trainings and seminars.	4.77	Very High Extent
I contribute ideas and insights during professional development sessions.	4.53	Very High Extent
I demonstrate active engagement in workshops and collaborative activities.	4.67	Very High Extent
I submit quality outputs required in professional development programs.	4.87	Very High Extent
I apply effort in accomplishing tasks assigned during trainings.	4.75	Very High Extent
I reflect seriously on activities conducted during professional development programs.	4.9	Very High Extent
Category Mean	4.74	Very High Extent

Table 2b presents the weighted mean and interpretation of teachers' engagement in professional development in terms of participation quality output. The overall weighted mean of 4.74, interpreted as Very High Extent, indicates that teachers consistently demonstrate high engagement in producing quality outputs during professional development activities. The highest-rated item, "I reflect seriously on activities conducted during professional development programs," obtained a weighted mean of 4.90, while the lowest, "I contribute ideas and insights during sessions," registered 4.53, both still Very High Extent.

These results suggest strong engagement in reflective and output-based tasks, although idea-sharing during sessions is comparatively lower, possibly due to confidence or time constraints. This implies a need to strengthen collaborative participation. The findings align with Darling-Hammond et al. (2017), Avalos (2016), and OECD (2019), emphasizing reflection and collaboration as key to effective professional development.

Commitment to Continuous Learning

Table 2c. Teacher's level of engagement in the professional development programs in terms of Commitment to continuous learning

Statement	Weighted Mean	Descriptive Value
I am committed to continuously improving my teaching competencies.	4.88	Very High Extent
I believe continuous professional learning is essential to my role as a teacher.	4.7	Very High Extent
I take responsibility for my own professional growth.	4.95	Very High Extent
I willingly engage in learning activities to improve my instructional practices.	4.8	Very High Extent
I stay updated with new teaching strategies and educational trends.	4.8	Very High Extent
I invest time and effort in professional learning activities.	4.75	Very High Extent
I view professional development as a long-term commitment rather than a requirement.	4.87	Very High Extent
Category Mean	4.82	Very High Extent

Table 2c presents the weighted mean and interpretation of teachers' engagement in professional development in terms of commitment to continuous learning. The overall weighted mean of 4.82, interpreted as Very High Extent, indicates a strong commitment to continuous professional growth. The highest-rated item, "I take responsibility for my own professional growth," obtained a weighted mean of 4.95, while the lowest, "I believe continuous

professional learning is essential to my role as a teacher," registered 4.70, both Very High Extent.

These results imply strong self-directed learning, although intrinsic motivation may still be strengthened. The findings align with Timperley (2017), Day and Gu (2016), and UNESCO (2018), emphasizing lifelong learning for teacher effectiveness.

Application of Learned Skills in The Classroom

Table 2d. Teacher's level of engagement in the professional development programs in terms of Application of learned skills in the classroom

Statement	Weighted Mean	Descriptive Value
I apply strategies learned from professional development programs in my classes.	4.75	Very High Extent
I integrate new teaching techniques gained from trainings into my lessons.	4.77	Very High Extent
I use instructional approaches learned from seminars to improve learner outcomes.	4.73	Very High Extent
I modify my teaching practices based on what I learn from professional development.	4.75	Very High Extent
I apply professional development learnings to address learners' needs.	4.78	Very High Extent
I use new classroom strategies learned from trainings regularly.	4.9	Very High Extent
Professional development programs influence how I plan and deliver my lessons.	4.62	Very High Extent
Category Mean	4.76	Very High Extent

Table 2d shows that teachers demonstrate a very high extent of applying professional development learnings in their classroom practices, with an overall weighted mean of 4.76. The highest indicator is regular use of new strategies (4.90), while lesson planning influence is slightly lower (4.62). This implies strong integration of training outputs into instruction, though alignment with lesson planning can still be improved. The findings affirm that professional development is effectively translated into classroom practice, enhancing teaching effectiveness (Guskey, 2016; Yoon et al., 2016; World Bank, 2018).

Summary Teachers' Level of Engagement in Professional Development Programs

Table 2e. Teacher's level of engagement in the professional development programs

Statement	Weighted Mean	Descriptive Value
Participation frequency	4.79	Very High

		Extent
Participation quality output	4.74	Very High Extent
Commitment to continuous learning	4.82	Very High Extent
Application of learned skills in the classroom	4.76	Very High Extent
Composite Mean	4.78	Very High Extent

Table 2e shows a very high overall engagement of teachers in professional development programs ($M = 4.78$). Commitment to continuous learning obtained the highest mean (4.82), while participation quality output was the lowest (4.74), though still very high. This indicates strong and sustained involvement in professional development, with active learning and classroom application. However, improving the quality of outputs and participation depth may further enhance professional growth and instructional effectiveness (OECD, 2019; World Bank, 2018; Hattie, 2017).

3. Teacher's Attitude Towards Professional Development

Perceived relevance

Table 3a. Teacher's attitude towards professional development programs in terms of Perceived relevance

Statement	Weighted Mean	Descriptive Value
Professional development programs are relevant to my teaching responsibilities.	4.83	Strongly Agree
The content of professional development programs matches my instructional needs.	4.88	Strongly Agree
Professional development activities address challenges I encounter in teaching Mathematics.	4.65	Strongly Agree
The topics of professional development programs are aligned with curriculum demands.	4.92	Strongly Agree
Professional development programs help me improve subject matter delivery.	4.67	Strongly Agree
The knowledge gained from professional development programs is applicable to my work.	4.88	Strongly Agree
Professional development activities are useful in enhancing my teaching effectiveness.	4.9	Strongly Agree
Category Mean	4.82	Strongly

		Agree/ Very Positive Attitude
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Table 3a shows that teachers strongly agree on the high relevance of professional development programs, with an overall weighted mean of 4.82. The highest-rated indicator is alignment with curriculum demands (4.92), while addressing Mathematics teaching challenges is slightly lower (4.65). This indicates that teachers view professional development as meaningful and supportive of curriculum implementation, though more contextualized and subject-specific training is still needed. The findings highlight that relevance strengthens teacher engagement and instructional responsiveness (Timperley, 2017; Day & Gu, 2016; Learning Policy Institute, 2016).

Motivation to participate

Table 3b. Teacher's attitude towards professional development programs in terms of Motivation to participate

Statement	Weighted Mean	Descriptive Value
I am motivated to attend professional development programs.	4.68	Strongly Agree
I willingly participate in professional development activities offered to me.	4.38	Agree
I feel encouraged to attend professional development programs.	4.83	Strongly Agree
I am personally interested in joining professional development activities.	4.78	Strongly Agree
I attend professional development programs even without incentives.	4.75	Strongly Agree
I feel enthusiastic about participating in trainings and seminars.	4.75	Strongly Agree
My interest in professional development motivates me to improve my teaching.	4.75	Strongly Agree
Category Mean	4.7	Strongly Agree/ Very Positive Attitude

Table 3b reveals the weighted mean and descriptive interpretation of the teachers' attitude towards professional development programs in terms of motivation to participate. The overall weighted mean of 4.70, interpreted as *Strongly Agree*, indicates that teachers exhibit a very positive level of motivation in engaging in professional development activities. The highest-rated statement, "I feel encouraged to attend professional development programs," obtained a weighted mean of 4.83 (*Strongly Agree*), while the lowest-rated statement, "I willingly participate in professional

development activities offered to me,” registered a weighted mean of 4.38, interpreted as *Agree*.

The finding means that teachers are generally motivated to participate in professional development due to both internal drive and external encouragement from their professional environment. It shows that teachers recognize the value of professional learning and are encouraged by institutional support and professional expectations. It implies that while teachers demonstrate strong motivation to engage in professional development, sustaining voluntary participation requires supportive conditions, manageable workload, and well-designed programs that align with teachers’ interests and contextual needs. The relatively lower rating on willingness to participate suggests that motivation may vary depending on the perceived relevance and practicality of the programs offered.

The findings are supported by European Commission (2018), which reported that teachers are more motivated to participate in professional learning when it is supported by school leadership and aligned with their professional needs. Similarly, World Bank (2020) emphasized that teacher motivation increases when professional development is relevant and responsive to teachers’ working conditions. In addition, UNESCO Institute for Statistics (2017) highlighted that supportive learning environments and access to professional development opportunities enhance teachers’ motivation and participation, thereby reinforcing the present findings.

Perceived benefits

Table 3c. Teacher’s attitude towards professional development programs in terms of Perceived benefits

Statement	Weighted Mean	Descriptive Value
Professional development programs improve my teaching competence.	4.63	Strongly Agree
Participation in professional development enhances my professional confidence.	4.75	Strongly Agree
Professional development programs help me become a more effective teacher.	4.82	Strongly Agree
I gain valuable knowledge from attending professional development activities.	4.77	Strongly Agree
Professional development programs improve my classroom management skills.	4.82	Strongly Agree
Professional development activities contribute to my career growth.	4.75	Strongly Agree
The benefits I gain from professional development outweigh the challenges of participation.	4.73	Strongly Agree
Category Mean	4.75	Strongly Agree/

		Very Positive Attitude
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Table 3c reveals the weighted mean and descriptive interpretation of the teachers’ attitude towards professional development programs in terms of perceived benefits. The overall weighted mean of 4.75, interpreted as *Strongly Agree*, indicates that teachers have a very positive perception of the benefits gained from participating in professional development programs. The highest-rated statements, “Professional development programs help me become a more effective teacher” and “Professional development programs improve my classroom management skills,” both obtained a weighted mean of 4.82 (*Strongly Agree*), while the lowest-rated statement, “Professional development programs improve my teaching competence,” registered a weighted mean of 4.63, also interpreted as *Strongly Agree*.

The finding means that teachers strongly recognize the value of professional development in enhancing instructional effectiveness and classroom management skills. It shows that teachers perceive professional development as beneficial in improving specific teaching practices, particularly in managing classrooms and delivering instruction effectively. It implies that while teachers clearly acknowledge the advantages of professional development, there is still a need to further strengthen programs to ensure that improvements are perceived holistically across all aspects of teaching competence, rather than being limited to specific skill areas.

The findings are supported by Garet et al. (2016), who found that professional development enhances instructional practices when it is content-focused and involves active learning. Similarly, Education Endowment Foundation (2021) emphasized that high-quality professional development improves teaching quality, classroom practices, and ultimately student outcomes. In addition, Australian Institute for Teaching and School Leadership (2018) reported that teachers perceive greater benefits from professional learning when it strengthens both specific teaching skills and overall professional competence.

Willingness to apply new learned strategies

Table 3d. Teacher’s attitude towards professional development programs in terms of Willingness to apply new learned strategies

Statement	Weighted Mean	Descriptive Value
I am willing to apply new teaching strategies learned from professional development programs.	4.73	Strongly Agree
I try new instructional approaches introduced during trainings.	4.68	Strongly Agree
I am open to changing my teaching practices based on professional development learnings.	4.73	Strongly Agree
I experiment with innovative teaching methods learned from seminars.	4.65	Strongly Agree

I am willing to adjust my lesson plans based on new strategies learned.	4.82	Strongly Agree
I use newly learned teaching approaches even if they require extra effort.	4.67	Strongly Agree
I continuously apply professional development learnings to improve my teaching practices.	4.83	Strongly Agree
Category Mean	4.73	Strongly Agree/ Very Positive Attitude

Table 3d shows that teachers strongly agree on their willingness to apply newly learned strategies, with an overall weighted mean of 4.73. The highest indicator is continuous application of PD learnings (4.83), while experimenting with innovative methods is slightly lower (4.65). This indicates strong receptiveness to professional learning and consistent integration into classroom practice. However, further support is needed to enhance experimentation with innovative strategies. Effective application of PD is reinforced by sustained support and follow-up (Guskey, 2016; ERO, 2018; Department for Education, 2016).

Summary Teacher's Attitude Towards Professional Development Programs

Table 3e. Teacher's attitude towards professional development programs

Statement	Weighted Mean	Descriptive Value
Perceived relevance	4.82	Very Positive Attitude
Motivation to participate	4.7	Very Positive Attitude
Perceived benefits	4.75	Very Positive Attitude
Willingness to apply new learned strategies	4.73	Very Positive Attitude
Composite Mean	4.75	Very Positive Attitude

Table 3e reveals the summary of the teachers' attitude towards professional development programs across four dimensions: perceived relevance, motivation to participate, perceived benefits, and willingness to apply newly learned strategies. The composite mean of 4.75, interpreted as *Very Positive Attitude*, indicates that teachers demonstrate a consistently strong and favorable attitude toward professional development programs. Among the four dimensions, perceived relevance obtained the highest weighted mean of 4.82 (*Very Positive Attitude*), while motivation to participate registered the lowest weighted mean of 4.70, also interpreted as *Very Positive Attitude*.

The finding means that teachers generally value professional development as an essential component of their professional growth, recognizing its importance, usefulness, and applicability in

enhancing teaching practices. It shows that teachers maintain a strong and consistent positive disposition across all dimensions of professional development, particularly in terms of relevance to their instructional roles. It implies that while teachers exhibit a very positive overall attitude toward professional development, strengthening motivational support and addressing contextual barriers such as workload, time constraints, and program alignment can further enhance sustained participation and engagement.

The findings are supported by Hargreaves and O'Connor (2018), who emphasized that teachers' attitudes toward professional learning are shaped by relevance, collaboration, and opportunities for meaningful engagement. Similarly, OECD (2020) reported that teachers with positive perceptions of professional development are more likely to sustain participation and improve their instructional practices. In addition, UNESCO (2020) highlighted that relevant and sustained professional development strengthens teacher commitment and supports continuous improvement in teaching, thereby reinforcing the present findings.

4. Teacher's level of teacher performance in terms of their IPCR

Table 4. Teacher's level of teacher performance in terms of their IPCR

Teacher's Performance	Frequency (n=60)	Percentage
KRA 1		
0.210- 0.315 (Poor)	0	0.00
0.315- 0.525 (Unsatisfactory)	0	0.00
0.525- 0.735 (Satisfactory)		
0.735- 0.945 (Very Satisfactory)	0	0.00
0.945- 1.050 (Outstanding)	60	100.00
Mean	1.04	
S.D.	0.02	
KRA 2		
0.210- 0.315 (Poor)	0	0.00
0.315- 0.525 (Unsatisfactory)	0	0.00
0.525- 0.735 (Satisfactory)	0	0.00
0.735- 0.945 (Very Satisfactory)	0	0.00
0.945- 1.050 (Outstanding)	60	100.00
Mean	1.04	
S.D.	0.03	
KRA 3		
0.210- 0.315 (Poor)	0	0.00
0.315- 0.525 (Unsatisfactory)	0	0.00
0.525- 0.735 (Satisfactory)	0	0.00
0.735- 0.945 (Very Satisfactory)	0	0.00
0.945- 1.050 (Outstanding)	60	100.00
Mean	1.03	

S.D.	0.02	
Overall Performance		
0.630- 0.944	0	0.00
0.945- 1.574	0	0.00
1.575- 2.204	0	0.00
2.205- 2.834	0	0.00
2.835- 3.150	60	100.00
Weighted Mean	3.11	
S.D.	0.06	

Table 4 shows that all teachers obtained an Outstanding IPCR rating across KRA 1, KRA 2, and KRA 3, with mean scores of 1.04, 1.04, and 1.03 respectively, and an overall weighted mean of 3.11. This indicates consistently outstanding performance in instructional delivery, professional responsibilities, and institutional compliance. It implies that teachers meet and exceed expected standards in all key areas. However, the uniform ratings suggest the need to review evaluation practices to ensure clearer performance differentiation and maintain assessment validity (DepEd, 2017; PPST, 2017; UNESCO, 2019).

5. Relationship between the Teacher's Job Performance and Teacher's Level of Engagement of Teachers in Professional Development

Table 5. Correlation between the teacher's job performance and teacher's level of engagement of teachers in professional development

Variables	KRA 1		KRA 2		KRA 3		Overall	
	r-value	p-value	r-value	p-value	r-value	p-value	r-value	p-value
Engagement of teachers in professional development and work performance								
Participation frequency	0.128	0.331	0.174	0.184	0.324	0.012*	0.242	0.063
Participation quality output	0.136	0.300	0.048	0.714	0.234	0.072	0.154	0.239
Commitment to continuous learning	-0.210	0.108	-0.241	0.064	-0.153	0.243	-0.232	0.075
Application of learned skills in the classroom	-0.184	0.160	-0.221	0.089	-0.031	0.814	-0.168	0.199

Table 5 shows a significant relationship between teachers' job performance and professional development engagement, with only participation frequency under KRA 3 yielding a significant correlation ($r = 0.324$, $p = 0.012$). Thus, the null hypothesis is partially rejected. This indicates that frequent participation in professional development is associated with improved curriculum planning, instructional organization, and teaching implementation.

It implies that sustained engagement helps teachers translate learning into effective lesson planning and classroom practices. The finding is supported by Darling-Hammond et al. (2017), Garet et al. (2016), and Desimone (2017), who emphasized the value of continuous professional learning.

Relationship Between the Teacher's Job Performance and Teacher's Attitude Towards Professional Development

Table 6. Correlation between the teacher's job performance and teacher's Attitude towards professional development

Variables	KRA 1		KRA 2		KRA 3		Overall	
	r-value	p-value	r-value	p-value	r-value	p-value	r-value	p-value
Attitude towards professional development and work performance								
Perceived relevance	-0.024	0.857	-0.024	0.857	0.098	0.459	0.020	0.882
Motivation to participate	0.280	0.030*	-0.161	0.220	0.033	0.805	-0.147	0.262
Perceived benefits	-0.200	0.125	-0.090	0.494	-0.067	0.613	-0.129	0.327
Willingness to apply new learned strategies	-0.241	0.064	-0.218	0.094	-0.012	0.926	-0.178	0.175

Table 6 shows a significant relationship between teachers' job performance and their attitude toward professional development, with motivation to participate under KRA 1 yielding a significant correlation ($r = 0.280$, $p = 0.030$). Thus, the null hypothesis is partially rejected. This indicates that motivated teachers demonstrate stronger content knowledge and pedagogical competence. It implies that intrinsic motivation enhances engagement in professional learning and improves instructional

practices. The finding is supported by Ryan and Deci (2017), Kyndt et al. (2016), and Darling-Hammond et al. (2017), who emphasized motivation as a key driver of effective teaching performance.

6. Relationship between the Teacher's Level of Engagement and Teacher's Attitude Towards Professional Development

Table 7. Correlation between the teacher's level of engagement and teacher's Attitude towards professional development

Variables	r-value	p-value	Statistical Inference
Attitude towards professional development and work performance			
Perceived relevance	0.768	0.000*	Significant
Motivation to participate	0.408	0.001*	Significant
Perceived benefits	0.196	0.134	Not Significant
Willingness to apply new learned strategies	0.345	0.007*	Significant

Table 7 presents the correlation statistics between the teachers' level of engagement and teachers' attitude towards professional development. The study initially hypothesized that there is no significant relationship between the teacher's level of engagement and teacher's attitude towards professional development. However, the results revealed that perceived relevance, motivation to participate, and willingness to apply new learned strategies are significantly related to teachers' level of engagement, while perceived benefits is not significantly related. Thus, the null hypothesis is partially rejected.

Perceived Relevance

The findings reveal that perceived relevance is significantly correlated with teacher's level of engagement ($r = 0.768$, $p = 0.000$). This means that teachers who perceive professional development as relevant to their teaching needs tend to demonstrate a higher level of engagement in such activities.

This implies that when teachers recognize the direct applicability of professional development to their instructional practices, they are more likely to actively participate, invest effort, and sustain their engagement. Relevance strengthens teachers' commitment and involvement in professional learning activities.

Further, in Buguey District, this means that teachers are more engaged in professional development programs when the content is closely aligned with their classroom realities, subject specialization, and immediate instructional needs. This suggests that contextualized and need-based professional development programs are more effective in promoting teacher engagement.

In support of the current study, Darling-Hammond et al. (2017) found that professional development that is content-focused and relevant to teachers' instructional context significantly increases teacher engagement. Similarly, Sims et al. (2021) reported that relevance to classroom practice is a strong predictor of teachers' active participation in professional learning.

Motivation to Participate

The findings reveal that motivation to participate is significantly correlated with teacher's level of engagement ($r = 0.408$, $p = 0.001$). This means that teachers who have higher motivation to participate in professional development activities tend to exhibit greater engagement.

This implies that motivation is a key factor that influences how actively teachers involve themselves in professional development. When teachers are motivated, they are more likely to participate consistently, contribute meaningfully, and sustain their involvement in learning activities.

Further, in Buguey District, this means that teachers who are intrinsically driven or encouraged by external factors are more inclined to take initiative in attending professional development

programs and maximizing learning opportunities. Motivation enhances their willingness to engage deeply in professional growth activities.

In support of the current study, Organisation for Economic Co-operation and Development (2019) reported that teacher motivation significantly influences participation and engagement in professional learning activities. Likewise, Cordingley et al. (2018) emphasized that motivated teachers are more likely to engage deeply in professional development and apply what they learn in practice.

Willingness to Apply New Learned Strategies

The findings reveal that willingness to apply new learned strategies is significantly correlated with teacher's level of engagement ($r = 0.345$, $p = 0.007$). This means that teachers who are more willing to apply newly learned strategies tend to exhibit higher levels of engagement.

This implies that readiness to implement new knowledge strengthens teachers' active involvement in professional development. When teachers are open to applying what they have learned, they are more likely to participate meaningfully and remain committed to continuous learning.

Further, in Buguey District, this means that teachers who are willing to translate training into classroom practice tend to be more engaged in professional development activities, as they see direct value in improving their instructional approaches.

In support of the current study, Kraft et al. (2018) found that teachers are more engaged in professional development when it is directly linked to classroom application. Similarly, Darling-Hammond et al. (2017) emphasized that opportunities for practice and application enhance both engagement and effectiveness of professional learning.

7. Enabling and Limiting Factors that Affect the Participation of Mathematics Teachers in Professional Development Activities

Table 8. Enabling and limiting factors that affect the participation of mathematics teachers in professional development activities

Statement	Weighted Mean	Descriptive Value
School administrators support teachers' participation in professional development programs.	4.83	Strongly Agree
Professional development opportunities are accessible to Mathematics teachers.	4.55	Strongly Agree

Time constraints limit my participation in professional development programs.	4.52	Strongly Agree
Heavy teaching workload affects my ability to attend trainings and seminars.	4.3	Agree
Limited funding restricts my participation in professional development activities.	4.62	Strongly Agree
Availability of substitute teachers affects my participation in professional development programs.	4.03	Agree
Lack of relevant professional development topics limits my interest in participation.	4.65	Strongly Agree
Category Mean	4.5	Strongly Agree

Table 8 reveals the weighted mean and descriptive interpretation of the enabling and limiting factors that affect the participation of mathematics teachers in professional development activities. The overall weighted mean of 4.50, interpreted as *Strongly Agree*, indicates that teachers strongly recognize the presence of both enabling and constraining factors influencing their participation. The highest-rated statement, “School administrators support teachers’ participation in professional development programs,” obtained a weighted mean of 4.83 (*Strongly Agree*), while the lowest-rated statement, “Availability of substitute teachers affects my participation in professional development programs,” registered a weighted mean of 4.03, interpreted as *Agree*.

The finding means that administrative support, accessibility of opportunities, and availability of resources serve as strong enabling factors that encourage teachers to engage in professional development. It shows that leadership support plays a crucial role in promoting teacher participation, while logistical concerns such as workload and time constraints may limit involvement. It implies that while teachers are highly supported and motivated to participate in professional development, addressing structural and operational barriers is necessary to ensure more consistent and full engagement in learning activities.

The findings are supported by European Commission (2020), which identified leadership support, time availability, and access to resources as key factors influencing teachers’ participation in professional development. Similarly, Education Endowment Foundation (2021) emphasized that effective professional development requires supportive school conditions, including leadership, time, and resources. In addition, World Bank (2019) highlighted that structural barriers such as workload, limited time, and insufficient support systems can hinder teachers’ engagement in professional learning, thereby reinforcing the present findings.

PROPOSED SCHOOL-BASED INTERVENTION PLAN

PROJECT MATH-UP (Mathematics Advancement Through Holistic and Unified Professional Development)

I. Rationale

PROJECT MATH-UP is grounded on the findings of the study which revealed that mathematics teachers demonstrate a very high

level of engagement and a very positive attitude toward professional development, particularly in terms of participation frequency, commitment to continuous learning, and application of learned strategies in the classroom. These results indicate that teachers are highly receptive to professional growth and are willing to continuously improve their instructional practices.

However, despite this strong engagement, the study identified key constraints that affect the consistency and sustainability of participation, including heavy workload, time limitations, limited funding, and insufficient institutional support mechanisms. Furthermore, while teachers perceive professional development as relevant and beneficial, participation is still influenced by contextual and structural factors, particularly in maintaining continuous engagement throughout the school year.

The findings also revealed that perceived relevance, motivation to participate, and willingness to apply learned strategies significantly influence teachers’ level of engagement. Moreover, participation frequency was found to have a significant relationship with teachers’ performance in curriculum planning and instructional delivery. This implies that sustained and structured professional development is essential in enhancing teaching effectiveness.

In the context of Buguey District, these findings highlight the need to shift from fragmented and episodic training toward a systematic, school-based, and sustained professional development program. Thus, PROJECT MATH-UP is proposed to establish a structured intervention that strengthens support systems, enhances teacher motivation, ensures accessibility of professional development, and promotes continuous application of learned competencies to improve instructional quality and learner outcomes in Mathematics.

II. Objectives

General Objective

To enhance mathematics teachers’ instructional competence and performance through a structured, school-based, and sustainable professional development program.

Specific Objectives

1. Strengthen teachers’ participation in professional development through accessible and well-structured programs.
2. Enhance teachers’ motivation and commitment to continuous professional learning.
3. Improve the application of professional development learnings in classroom instruction.
4. Address institutional and structural barriers such as workload, time constraints, and resource limitations.
5. Establish a sustainable monitoring and evaluation system for professional development implementation.

III. Participants

The participants of the program include:

- Mathematics Teachers (Primary Beneficiaries)
- Master Teachers
- School Heads

- District Supervisors
- Mathematics Coordinators
- External Trainers and Resource Speakers

- Parents and PTA Officers (Support Stakeholders)
- Local Government Units (LGU) and Private Partners

IV. Activity Matrix

Specific Learning Objective	Activities	Time Frame	Materials/Resources Needed	Estimated Budget	Expected Output (Based on Findings)
Strengthen structured PD system	Orientation and creation of PD Committee	June	Meeting materials, guidelines	₱3,000	Functional PD Committee addressing lack of institutional support
Align PD with teachers' needs (relevance issue)	Strategic planning workshop (SIP/AIP integration)	June	Planning templates, documents	₱5,000	Contextualized PD aligned with teachers' needs (addresses relevance finding)
Increase participation frequency	Conduct LAC sessions and Math trainings	Quarterly	Training modules, ICT tools	₱15,000	Increased participation consistency despite workload constraints
Improve participation quality (low idea-sharing)	Collaborative workshops and sharing sessions	Quarterly	Activity sheets, collaboration tools	₱8,000	Enhanced teacher interaction and idea-sharing during PD
Strengthen commitment to continuous learning	Coaching and mentoring (Master Teachers)	Whole year	Coaching tools, observation forms	₱5,000	Sustained motivation and professional growth among teachers
Enhance application of learned strategies	Demo teaching and lesson study	Quarterly	Lesson plans, observation tools	₱10,000	Improved classroom application of PD learnings
Address constraints (time, workload, support)	Flexible scheduling and provision of substitute teachers	Whole year	MOOE, LGU support	₱12,000	Reduced barriers related to time, workload, and resources
Monitor and evaluate PD implementation	SWOT analysis and M&E tools	Quarterly	Evaluation tools, forms	₱5,000	Continuous improvement based on feedback and findings
Sustain and institutionalize PD	Partnership building and policy development	Whole year	MOA, proposals	₱7,000	Institutionalized professional development system
Improve learner outcomes in Mathematics	Continuous strategy application and assessment	Whole year	Assessment tools	₱10,000	Improved student performance in Mathematics

Conclusion

The study concludes that mathematics teachers in the secondary schools of Buguey District demonstrated very high engagement and favorable attitudes toward professional development; however, its relationship with teacher performance is partial rather than universal. Participation frequency was significantly linked to curriculum and planning (KRA 3), while motivation to participate was associated with content knowledge and pedagogy (KRA 1), indicating that specific dimensions of engagement influence particular performance areas. Despite this, most engagement and attitude variables showed no significant relationship with overall performance, suggesting that participation and positive perceptions alone are insufficient to ensure consistent improvement, as performance is also shaped by factors such as institutional support, resources, and implementation practices. Although teachers' attitudes influence their level of engagement, this does not automatically translate into improved classroom performance, highlighting a gap between participation and application. Therefore, professional development programs should prioritize relevance, motivation, and practical application, supported by structured and sustained institutional mechanisms to enhance teaching performance.

Recommendations

In light of the findings and conclusions of the study, several recommendations are proposed to enhance professional development among mathematics teachers. Teachers are encouraged to improve consistency in participation, actively engage in idea-sharing, and apply learned strategies in lesson planning and classroom instruction. School heads may strengthen teachers' intrinsic motivation by providing recognition, encouragement, and supportive conditions that promote voluntary engagement in professional development. They, together with LGUs, should also address logistical constraints such as workload, time limitations, funding, and lack of substitute teachers to ensure sustained participation. Professional organizations and school leaders are encouraged to design contextualized, needs-based training programs aligned with classroom realities. Monitoring and evaluation mechanisms should likewise be strengthened to ensure effective application of learning. Finally, educational leaders may institutionalize sustainable professional development systems, while future researchers may explore factors influencing participation, instructional application, and systemic support.

Declaration of no Conflict of Interest

The author hereby declares no conflict of interest. This article is solely her original work.

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