The International Review of Multidisciplinary Research
Volume 1, Issue 9, July 2026, pp. 1-11
https://doi.org/10.67167/vertex.675

Teachers' Enthusiasm and Instructional Support Towards Learners' Mathematics Performance: Basis for Strategic Plan

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Article Details:

Received: 25 March 2026
Revised: 30 March 2026
Accepted: 9 April 2026
Published: 11 July 2026
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Recommended Citation:

Duller, C. T. (2026). Teachers' Enthusiasm and Instructional Support Towards Learners' Mathematics Performance: Basis for Strategic Plan. The International Review of Multidisciplinary Research. 1 (9), 1-11. https://doi.org/10.67167/vertex.675

Index Terms:

enthusiasm, instructional support, Mathematics performance, teachers, learners

Abstract. This study examined the extent of teachers' enthusiasm and instructional support and their influence on learners' mathematics performance in selected private secondary schools within the City of Kabankalan during the School Year 2018-2019. The primary objective was to determine whether teachers' enthusiasm—measured through variables such as expressiveness, passion, attitude, and engagement—and instructional strategies significantly impacted students' achievement in mathematics. The research employed a descriptive-correlational design, utilizing self-developed questionnaires to gather data on teachers' attitudes and instructional support, and secondary data from report cards assessed learners' mathematics performance. The instruments were carefully designed to measure teachers' enthusiasm and instructional strategies. Data analysis involved descriptive statistics to outline general tendencies and correlation tests, such as Pearson's r and Spearman's Rho, to explore relationships among variables. Results showed that teachers generally exhibited high to very high levels of enthusiasm, especially in attitude and engagement, fostering a positive classroom atmosphere. Instructional support strategies, including guided practice, differentiated instruction, feedback, and active engagement, were rated as high or very high. However, despite these positive ratings, the data revealed no significant direct relationships between these variables and students' mathematics achievement. Specifically, teacher enthusiasm variables did not significantly correlate with learners' academic performance. These findings suggested that while enthusiasm and instructional support motivated students and created engaging environments, they did not automatically lead to higher academic achievement. The study highlighted that other factor, such as students' cognitive abilities, external support systems, and overall quality of instruction, likely had a greater impact on performance. It recommended ongoing professional development, varied instructional methods, and consideration of additional variables to enhance student outcomes.

Introduction

The current study seeks to build on existing research by longitudinally exploring the relationship between student-reported teacher enthusiasm and learners' perceptions of various supportive behaviors from their teachers, specifically regarding learners' experiences of autonomy, competence, social relatedness, and the relevance of the subject matter. Additionally, the study considers learners' mastery goal orientation and behavioral engagement in mathematics as outcome variables. Therefore, the primary aim of this research is to examine whether and to what extent teacher enthusiasm influences student motivation indirectly using supportive instructional practices.

This study offered valuable insights to educational authorities by highlighting the critical role of teachers' enthusiasm and supportive instructional practices in fostering student motivation and engagement. By longitudinally examining how teacher enthusiasm indirectly impacted learners' perceptions of autonomy, competence, social relatedness, and subject relevance, as well as their mastery goal orientation and behavioral engagement in mathematics, the research underscores the importance of emotional and motivational aspects of teaching. These findings could inform professional development

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programs aimed at enhancing teachers' enthusiasm and their use of supportive instructional strategies, ultimately leading to more motivated and engaged learners. Furthermore, the study's insights into the causal pathways between teacher motivation and learners' outcomes can inform policy decisions to prioritize teacher training and classroom practices that foster enthusiasm and support students' needs. As a result, educational authorities can implement targeted interventions to improve teaching quality, boost student achievement, and foster a positive learning environment across schools.

Hence, this study focused on the extent of teachers' enthusiasm and instructional support towards learners' mathematics performance as a basis for a strategic plan in a selected higher education private secondary school in the City of Kabankalan, Negros Occidental, for the School Year 2018-2019.

Research Questions

This research aimed to determine the extent of teachers' enthusiasm and instructional support towards learners' Mathematics Performance as a basis for a strategic plan in private secondary schools in the City of Kabankalan for School Year 2018-2019. Specifically, this study aimed to answer the following questions:

1. What is the extent of teachers' enthusiasm in teaching Mathematics in terms of:
   a. Expressiveness
   b. Passion
   c. Attitude
   d. Engagement
   e. As a whole?
2. What is the extent of Mathematics teachers' instructional support to learners in terms of:
   a. Guided Practice
   b. Differentiated Instruction
   c. Feedbacking
   d. As a whole?
3. What is the level of learners' Mathematics performance based on their School Report Card?
4. Is there a significant relationship between the extent of teachers' enthusiasm in teaching mathematics and their instructional support to learners?
5. Is there a significant relationship between the extent of teachers' enthusiasm in teaching and learners' Mathematics performance?
6. Is there a significant relationship between the extent of teachers' instructional support and learners' Mathematics performance?

Methodology

This study employed a descriptive-correlational research design to determine the extent of teachers' enthusiasm and instructional support towards learners' mathematics performance in a private secondary school in the City of Kabankalan for School Year 2018-2019. As cited in Creswell's (2018) study, this source defines quantitative research as a process of testing objective theories by examining relationships among variables. Creswell explains the importance of using survey instruments to collect data and utilizing statistical procedures to generalize findings from a sample to a population. He emphasizes that quantitative designs require a deductive approach, emphasizing objectivity, the use of numerical data, and the minimization of bias. In this study, the descriptive component focused on identifying the extent to which teachers use active learning strategies, game-based learning, differentiated instruction, technology integration, and problem-based learning, and the level of learners' mathematics performance. The correlational component examined the relationship between teachers' instructional practices and learners' mathematics performance. Data collection employed quantitative methods, and the analysis involved descriptive statistics, such as the mean, as well as inferential statistics, such as Spearman's Rho, to determine the strength and direction of the relationship. The research was conducted in private secondary schools in Kabankalan City, Negros Occidental, for School Year 2018-2019.

The instrument included items across four main categories measuring teachers' enthusiasm for teaching mathematics, including expressiveness, passion, attitude, and engagement. In addition, the second part of the instrument included categories for mathematics teachers' instructional support, including guided practice, differentiated instruction and feedback. Each category contained five items, which were rated on a 5-point Likert scale, with ratings interpreted as follows: 5 (Strongly Agree) = very high; 4 (Agree) = high; 3 (Undecided) = neutral; 2 (Disagree) = low; 1 (Strongly Disagree) = very low. The scale used by the researcher was 1 (1. 00-1. 79) = Strongly Disagree, 2 (1. 80-2. 59) = Disagree, 3 (2. 60-3.

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39) = Neutral, 4 (3. 60-4. 19) = Agree, 5 (4. 20-5. 00) = Strongly Agree. On the other hand, the researcher used this rating to determine learners' mathematics performance, including Outstanding (90-100), Very Satisfactory (85-89), Satisfactory (80-84), Fairly Satisfactory (75-79), and Did Not Meet Expectations (Below 75). The questionnaire underwent validation by three subject matter experts, yielding an average validity rating of 4. 26, indicating good content validity. The instrument's reliability was high, with a Cronbach's alpha of 0.96. The reliability was based on 30 respondents selected from the population and not included in the actual sample.

Before conducting the study in selected secondary schools in the City of Kabankalan, the researcher ensured compliance with all suggestions and recommendations outlined in the manuscript. The researcher also sought approval from the proper authorities to conduct the study among the administrators of 3 selected private secondary schools. Once approval was obtained, the researcher electronically sent permission letters formally requesting that a study be conducted in their school and the nearby school district for reliability testing. The respondents were contacted directly through face-to-face interactions, with assistance from their school administrators. The purpose and scope of the study were thoroughly explained to each respondent, with the help of their respective school heads, along with the steps to ensure the accuracy and authenticity of the collected data. All respondents were requested to complete the questionnaire carefully, as it was explained during the face-to-face sessions by the school heads and the researcher.

Additionally, teachers were present to assist during the study and ensured that 100% of the target respondents completed the questionnaire. Each teacher-respondent was then asked to provide the average mathematics performance of learners, and the researcher used the learners' average grade for the entire grading period. After data collection through the survey, the researcher gathered, tallied, tabulated, and analyzed the data using appropriate statistical tools for each research problem. Lastly, the statistical tools used to analyze the data were the mean and standard deviation, and Pearson's r, using the Statistical Package for the Social Sciences (SPSS).

The following were the statistical tools used to determine the extent of teachers' enthusiasm and instructional support for learners' Mathematics Performance as baa sis for a strategic plan in private secondary schools in the City of Kabankalan for School Year 2018-2019. To determine the extent of teachers' enthusiasm in teaching Mathematics, the mean and standard deviation were used. To identify the extent of Mathematics Teachers' instructional support to learners, the mean and standard deviation were used. To determine learners' Mathematics Performance, the mean and standard deviation were used. To examine the relationship between the extent of teachers' enthusiasm for teaching mathematics and their instructional support for learners, Pearson's r was used. To identify the relationship between teachers' enthusiasm in teaching and learners' Mathematics performance, Spearman's Rho was used. To determine the relationship between the extent of teachers' instructional support and learners' Mathematics performance, Spearman's rho was used.

In conducting this study, strict ethical standards were observed. Formal approval was obtained from the school authorities and relevant review boards before data collection. Teachers, the respondents in the study, were fully informed about the study's purpose, procedures, and voluntary participation through clear communication facilitated by their school heads and the researchers. Since the respondents were adult educators teaching mathematics at the secondary level, the appropriate ethical procedure involved securing informed consent to affirm voluntary participation and understanding of the study's nature. Confidentiality and anonymity of responses were strictly maintained, with data securely stored and used solely for academic purposes. The researchers ensured that data collection methods posed no harm or discomfort to participants, upholding their dignity and rights throughout the process. Approval to use learners' mathematics performance data was also properly communicated to the school authorities, and ensured that the data gathered was strictly confidential and handled with utmost confidentiality.

Results and Discussion

Extent of Teachers' Enthusiasm in Teaching Mathematics

Table 1 showed the extent of teachers' enthusiasm in teaching mathematics, specifically in the categories of expressiveness (mean=4.12; SD=.537) and passion (mean=3.88; SD=.478), both of which were high. On the other hand, attitude (mean=4.50; SD=.508) and engagement (mean=4.21; SD=.410) were very high. Lastly, the overall extent of teachers' enthusiasm in teaching Mathematics in School A was found to beto be high, with a mean score of 4.18 and a standard deviation of. 190.

The study revealed that teachers in School A exhibited high enthusiasm for teaching mathematics, particularly in attitudes and engagement, which likely fostered a more engaging learning environment and positively influenced learners' attitudes toward mathematics.

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Teacher reports of teaching enthusiasm and subject enthusiasm, however, did not predict student-perceived instruction and student motivation. Moreover, in a cross-sectional study, Cui et al. (2017) found significant relationships between students' reports of teacher enthusiasm and autonomy support. In a longitudinal study, Kunter et al. (2013) focused solely on teaching enthusiasm. They confirmed that teachers' self-reported teaching enthusiasm has class-level effects on students' reports of their teachers' provision of learning support and classroom management. In addition, students in classes with enthusiastic teachers reported more enjoyment and greater achievement gains in mathematics one year later. Moreover, the authors were interested in exploring the mediating effects of specific teaching behaviors. They found that the positive class-level effect of teaching enthusiasm on students' mathematics achievement was mediated solely by students' perceived classroom management. In contrast, the positive class-level effect of teaching enthusiasm on students' mathematics enjoyment was mediated by student reports of both classroom management and teacher-provided learning support.

Indicators	N	Mean Score	Standard Deviation	Descriptive Interpretation
a. Expressiveness	34	4. 12	. 537	High
b. Passion	34	3. 88	. 478	High
c. Attitude	34	4. 50	. 508	Very High
d. Engagement	34	4. 21	. 410	Very High
As a whole	34	4. 18	. 190	High

Legend: Very High (5. 00-4. 20); High (4. 19-3. 40); Moderate (3. 39-2. 60); Low (2. 59-1. 80); Very Low (1. 00-1. 79)

Table 1. Extent of Teachers' Enthusiasm in Teaching Mathematics in School A

Table 2 showed the extent of teachers' enthusiasm in teaching mathematics in School B, specifically in the categories of expressiveness (mean=4.18; SD=.521) and passion (mean=3.76; SD=.554), which were both found to be high. On the other hand, attitude (mean=4.56; SD=.504) and engagement (mean=4.62; SD=.493) were very high. Lastly, the overall extent of teachers' enthusiasm in teaching Mathematics in School B was found to be very high, with a mean score of 4.28 and a standard deviation of. 244.

The results indicated that teachers in School B demonstrated high enthusiasm for teaching mathematics, particularly in their expressiveness and passion, likely creating an engaging classroom environment. Their positive attitude and active engagement suggested strong dedication, which could have enhanced learner motivation and performance, fostering a stimulating learning atmosphere.

Student engagement has been studied in various populations and educational settings (Bear, Yang, Chen, He, Xie, & Huang, 2018). While student engagement has been examined across different disciplines, research indicates that the relationship among emotional, organizational, and instructional support and student engagement in mathematics classes is best examined through observation and student and teacher perspectives. Such a study involving a large sample has been a gap in the literature for a long time. Student engagement is classified into behavioral, cognitive, and emotional engagement. Students' attention, completed work, participation in learning opportunities, and polite behavior are considered indicators of behavioral engagement (Wimpenny & Savin-Baden, 2013).

Indicators	N	Mean Score	Standard Deviation	Descriptive Interpretation
a. Expressiveness	34	4. 18	. 521	High
b. Passion	34	3. 76	. 554	High
c. Attitude	34	4. 56	. 504	Very High
d. Engagement	34	4. 62	. 493	Very High
As a whole	34	4. 28	. 244	Very High

Legend: Very High (5. 00-4. 20); High (4. 19-3. 40); Moderate (3. 39-2. 60); Low (2. 59-1. 80); Very Low (1. 00-1. 79)

Table 2. Extent of Teachers' Enthusiasm in Teaching Mathematics in School B

Table 3 showed the extent of teachers' enthusiasm for teaching mathematics in School C, specifically in the expressiveness category (mean = 4.12; SD = .591), which was found to be high. On the other hand, passion (mean=4. 26; SD=. 511), attitude (mean=4. 29; SD=. 629) and engagement (mean=4. 41; SD=. 609) were found as very high. Lastly, the overall extent of teachers' enthusiasm in teaching Mathematics in School C was found to be very high, with a mean score of 4.27 and a standard deviation of. 256.

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The data indicated that teachers in School C generally demonstrated high to very high enthusiasm for teaching mathematics, which likely contributed to a positive, motivating classroom environment. Their strong passion, attitude, and engagement probably enhanced learners' interest and participation, supporting effective learning experiences in mathematics.

According to Van den Heuvel-Panhuizen and Drijvers (2014), the primary thrust of RME is that realistic situations can support "the development of mathematical concepts, tools, and procedures" whilst also providing students with meaningful contexts in which they can subsequently apply their burgeoning mathematical knowledge. Despite prior research outlining the potential power of teaching mathematics through meaningful contexts and evidence supporting inquiry-based learning approaches more generally, we could not identify any prior research specifically examining the benefits of building thematic units around topics of teacher interest and passion. A student's biological sex may moderate the association between perceived teacher support and math attitudes. Among a sample of children and adolescents spanning elementary (grade 5), middle (grade 8), and high school, as well as early college, Cognitive engagement refers to students' willingness to exert effort to understand the content and focus on tasks (Makur, Prahmana, & Gunur, 2019).

Indicators	N	Mean Score	Standard Deviation	Descriptive Interpretation
a. Expressiveness	34	4. 12	. 591	High
b. Passion	34	4. 26	. 511	Very High
c. Attitude	34	4. 29	. 629	Very High
d. Engagement	34	4. 41	. 609	Very High
As a whole	34	4. 27	. 256	Very High

Legend: Very High (5. 00-4. 20); High (4. 19-3. 40); Moderate (3. 39-2. 60); Low (2. 59-1. 80); Very Low (1. 00-1. 79)

Table 3. Extent of Teachers' Enthusiasm in Teaching Mathematics in School C

Extent of Mathematics Teachers' Instructional Support to Learners

Table 4 showed that in school A, teachers' instructional support to learners in the guiding practice category (mean=4.12; SD=.327), differentiated instruction (mean=4.15; SD=.359), and feedback (mean=4.06; SD=.648) were all found to be high. Meanwhile, active engagement (mean=4.50; SD=.508) was found to be very high. The overall extent of Mathematics Teachers' Instructional Support to learners has a mean score of 4. 21 and a standard deviation of. 199.

The findings indicated that teachers in School A provided high levels of instructional support, particularly in active engagement, which likely contributed to more effective learning experiences. The overall support was strong, suggesting that teachers' efforts in guiding practice, differentiated instruction, and feedback may have positively impacted learners' understanding and participation in mathematics lessons.

Loes (2022) showed that engaging students in co-constructing knowledge through collaborative activities boosts motivation and fosters a more inclusive learning environment. This participatory approach not only develops interpersonal skills but also enables learners to gain insights from diverse viewpoints, thereby enriching their overall educational experience.

Indicators	N	Mean Score	Standard Deviation	Descriptive Interpretation
a. Guided Practice	34	4. 12	. 327	High
b. Differentiated Instruction	34	4. 15	. 359	High
c. Feedbacking	34	4. 06	. 648	High
d. Active Engagement	34	4. 50	. 508	Very High
As a whole	34	4. 21	. 199	Very High

Legend: Very High (5. 00-4. 20); High (4. 19-3. 40); Moderate (3. 39-2. 60); Low (2. 59-1. 80); Very Low (1. 00-1. 79)

Table 4. Extent of Mathematics Teachers' Instructional Support to Learners School A

Table 5 showed that in school B, teachers' instructional support to learners in the guiding practice category (mean=4.15; SD=.558) and differentiated instruction (mean=4.12; SD=.591) were both found to be high. Meanwhile, feedback (mean=4.50; SD=.564) and active engagement (mean=4.29; SD=.629) were very high. The overall extent of Mathematics Teachers' Instructional Support to learners has a mean score of 4. 26 and a standard deviation of. 261.

The findings showed that teachers in School B provided strong instructional support, especially through feedback and active engagement, likely boosting learners' engagement and learning. Their focus on guiding practice and differentiated

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instruction indicated efforts to meet diverse student needs, promoting better understanding and achievement in mathematics. Overall, this reflected a dedicated effort to create an effective and responsive learning environment.

Harris and Brown (2013) reported the need for further clarification of the four feedback levels, their application in the classroom, and their influence on learners. They also reported that the feedback level of self needs to be considered further. By incorporating active learning techniques such as problem-solving, group discussions, hands-on activities, and real-world applications, educators provide students with opportunities to experience success, build confidence, and deepen their understanding of their capabilities (McCarthy & Anderson, 2000).

Indicators	N	Mean Score	Standard Deviation	Descriptive Interpretation
a. Guided Practice	34	4. 15	. 558	High
b. Differentiated Instruction	34	4. 12	. 591	High
c. Feedbacking	34	4. 50	. 564	Very High
d. Active Engagement	34	4. 29	. 629	Very High
As a whole	34	4. 26	. 261	Very High

Legend: Very High (5. 00-4. 20); High (4. 19-3. 40); Moderate (3. 39-2. 60); Low (2. 59-1. 80); Very Low (1. 00-1. 79)

Table 5. Extent of Mathematics Teachers' Instructional Support to Learners School B

Table 6 showed that in school C, teachers' instructional support to learners in guiding practice (mean=4.12; SD=.591) and differentiated instruction (mean=3.97; SD=.577) were both high. Meanwhile, feedback (mean=4.35; SD=.597) and active engagement (mean=4.32; SD=.535) were found to be very high. The overall extent of Mathematics Teachers' Instructional Support to learners in School C has a mean score of 4. 19 and a standard deviation of. 231.

Teachers in School C provided strong instructional support, especially in feedback and engagement, creating a supportive, tailored learning environment that likely enhanced learners' understanding and participation in mathematics.

Through these interactive methods, learners not only acquire knowledge but also cultivate a sense of competence and autonomy, which are essential components of self-efficacy (Zimmerman, 2020). Thus, active learning strategies catalyze enhancing learners' belief in their ability to tackle challenges and achieve academic goals, ultimately fostering a positive and empowering learning environment. Harris et al. (2013) identified the processing of and the affective reaction to feedback as an area for future research. Researchers agree that developing an understanding of students' perceptions and processing is key to using feedback effectively to enhance achievement and understanding. Despite these gaps, a body of work emerging in the assessment and feedback literature is beginning to address these questions.

Indicators	N	Mean Score	Standard Deviation	Descriptive Interpretation
a. Guided Practice	34	4. 12	. 591	High
b. Differentiated Instruction	34	3. 97	. 577	High
c. Feedbacking	34	4. 35	. 597	Very High
d. Active Engagement	34	4. 32	. 535	Very High
As a whole	34	4. 19	. 231	High

Legend: Very High (5. 00-4. 20); High (4. 19-3. 40); Moderate (3. 39-2. 60); Low (2. 59-1. 80); Very Low (1. 00-1. 79)

Table 6. Extent of Mathematics Teachers' Instructional Support to Learners in School C

Level of Learners' Mathematics Performance

Table 7 showed that the mathematics performance of learners in School A has a mean score of 86. 71, with a standard deviation of 3. 50. School B has a mean performance score of 86. 97, with a standard deviation of 3.64, and School C obtained a mean performance score of 88: 42 and a standard deviation of 6.30, which were all interpreted as very satisfactory. Meanwhile, the overall mathematics performance of learners in 3 selected private secondary schools in the City of Kabankalan has a mean score of 87:36 and a standard deviation of 3.53.

The data indicated that learners in all three schools demonstrated very satisfactory mathematics performance, with scores slightly higher in School C, suggesting effective instructional support. The overall instructional support provided by teachers in School C was also high, implying that their strong support may have contributed to the learners' positive performance outcomes.

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People with these career skills are in high demand and require a great deal of specialization; these careers often command a high level of prestige and an accompanying high salary (National Association of Colleges and Employers, 2013).

Table 7. Level of Learners' Mathematics Performance

Mathematics Performance of Learners	N	Mean Score	Standard Deviation	Descriptive Interpretation
School A	34	86. 71	3. 50	Very Satisfactory
School B	34	86. 97	3. 64	Very Satisfactory
School C	34	88. 42	6. 30	Very Satisfactory
As a whole	102	87. 36	3. 53	Very Satisfactory

Legend: Outstanding (90-100), Very Satisfactory (85-89), Satisfactory (80-84), Fairly Satisfactory (75-79) and Did Not Met Expectations (Below 75)

Relationship between the Extent of Teachers' Enthusiasm in Teaching Mathematics and their Instructional Support to Learners

Table 8 presented the relationship between the extent of teachers' enthusiasm and their support for learners in the City of Kabankalan, Negros Occidental, for School Year 2018-2019.

The table showed that expressiveness and feedback have an R-value of. 210 and a p-value of. 034, which indicated that both were related, leading to rejection of the null hypothesis. On the other hand, expressiveness and guided principle have an R-value of. 044 and p-value of .660, expressiveness and differentiated instruction have an R-value of. 038 and a p-value of. 703, lastly, expressiveness and active engagement have an R-value of. 025 and the p-value. 800 were all found not related. Moreover, passion and guided practice with an R-value. 228* and a p-value of. 021 and differentiated instruction with an R-value. 267** and a p-value of .007 were all found to be related to each other, with an R-value of. 060 and a p-value of. 551 and active engagement with R-value of. 060 and a p-value of. 549 were all found to be unrelated to passion. In addition, attitude and guided principle have an R-value of. 076 and p-value of. 448, attitude and differentiated instruction have an R-value of. 013 and a p-value of. 894, feedback has an R-value of. 056 and the p-value. 574, and active engagement has an R-value of. 036 and the p-value. 719 were all found not related. Lastly, feedback has an R-value of. 215* and the p-value. 035 was found to be related to engagement, meaning the null hypothesis was rejected.

Meanwhile, engagement and guided practice have an R-value of. 013 and p-value of. 896, differentiated instruction has an R-value of. 046 and a p-value of. 645, and active engagement has an R-value of. 079 and the p-value. 430 were found to be unrelated, indicating that the null hypothesis was accepted.

The findings implied that certain variables, such as expressiveness and feedback, as well as passion and guided practice, demonstrated significant relationships, suggesting that enhancing these areas could potentially improve related instructional practices. Conversely, variables such as expressiveness and guided principle, differentiated instruction, active engagement, attitude and guided principle, attitude and differentiated instruction, feedback, and engagement with guided practice or active engagement showed no significant correlations, suggesting that these factors may have operated independently within the context studied. The rejection or acceptance of null hypotheses in specific pairs underscored the importance of focusing on the significant relationships identified, which could inform targeted interventions to foster more effective teaching strategies. Overall, these results underscored the nuanced nature of instructional variables and their complex interrelations, emphasizing the need for educators to prioritize areas with demonstrated significance to optimize educational outcomes.

Differentiated Instruction (DI) aims to meet students' individual learning needs by maximizing learning opportunities (Gheyssens et al., 2020; Maulana et al., 2020). Since DI is rooted in addressing students' specific learning demands (Smale-Jacobse et al., 2019), it has been recognized as an inclusive educational approach that promotes equity and educational justice (Valiandes & Neophytou, 2018; Lindner & Schwab, 2020). Moreover, DI is widely regarded as a fundamental component of effective teaching (Organization for Economic Co-operation and Development, 2012). Despite its potential as a promising inclusive strategy (Roy et al., 2013), and although educators acknowledge the importance of differentiating instruction to cater to diverse learning needs (Valiandes & Neophytou, 2018), the actual implementation of DI in daily teaching practices remains a challenge. Numerous studies have highlighted that teachers worldwide often struggle to differentiate instruction effectively and seldom modify their teaching methods based on students' individual characteristics (van Geel et al., 2019).

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Indicators	Guided Practice	Differentiated Instruction	Feedbacking	Active Engagement
a. Expressiveness				
R-value	. 044	. 038	. 210	. 025
p-value	. 660	. 703	. 034	. 800
Interpretation	Not Significant	Not Significant	Significant	Not Significant
Decision	Accept Ho	Accept Ho	Reject Ho	Accept Ho
b. Passion				
R-value	. 228*	. 267**	. 060	. 060
p-value	. 021	. 007	. 551	. 549
Interpretation	Significant	Significant	Not Significant	Not Significant
Decision	Reject Ho	Reject Ho	Accept Ho	Accept Ho
c. Attitude				
R-value	. 076	. 013	. 056	. 036
p-value	. 448	. 894	. 574	. 719
Interpretation	Not Significant	Not Significant	Not Significant	Not Significant
Decision	Accept Ho	Accept Ho	Accept Ho	Accept Ho
d. Engagement				
R-value	. 013	. 046	. 215*	. 079
p-value	. 896	. 645	. 035	. 430
Interpretation	Not Significant	Not Significant	Significant	Not Significant
Decision	Accept Ho	Accept Ho	Reject Ho	Accept Ho

Legend: At .05 level of significance.

Table 8. Relationship between the Extent of Teachers' Enthusiasm in Teaching Mathematics and their Instructional Support to Learners

Relationship between the Extent of Teachers' Enthusiasm in Teaching Mathematics and Learners' Mathematics Performance

The analysis revealed that the variables of expressiveness, passion, attitude, and engagement all exhibited low correlation coefficients with mathematics performance, with R-values of. 164,. 180,. 126 and 127, respectively and p-values exceeding the 0.05 significance level. These results indicated that there was no statistically significant relationship between these variables and the learners' performance in mathematics, leading to the acceptance of the null hypotheses. Specifically, expressiveness, the learners' ability to articulate mathematical ideas, did not significantly influence their performance, suggesting that merely expressing oneself was insufficient to affect learning outcomes. Similarly, passion, or learners' enthusiasm towards mathematics, did not correlate with improved performance, implying that motivation alone might not directly translate into better understanding or skills. Attitude, reflecting learners' perceptions and feelings towards mathematics, also showed no significant relationship, indicating that positive or negative attitudes did not necessarily predict achievement levels. Lastly, engagement, or participation in mathematical activities, did not demonstrate a significant association with performance, suggesting that active involvement alone was not enough to enhance learners' mastery of mathematical concepts.

These findings implied that other factors, possibly cognitive abilities, instructional quality, or external support, might have played more prominent roles in influencing mathematics achievement, and that fostering expressiveness, passion, attitude, or engagement in isolation may not be sufficient to improve learners' mathematical performance.

In extending previous research (Lazarides et al., 2017; Schiefele, 2017), we confirmed indirect relations between student-perceived teacher enthusiasm and both student mastery goals and engagement, mediated by supportive instructional practices. While we found significant total indirect effects of teacher enthusiasm on student mastery goals and engagement, only autonomy and social support were significantly related to the dependent variables. Accordingly, specific indirect effects of teacher enthusiasm on student mastery goals were only obtained for autonomy and social support. However, the specific indirect effect of teacher enthusiasm on student engagement did not attain significance, although the total indirect effect in this case also relies mainly on the mediation effects of both autonomy and social support.

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Indicators	Correlation Coefficient (r)	p-value	Interpretation	Decision
a. Expressiveness	. 164	. 099	Not Significant	Accept Ho
b. Passion	. 180	. 070	Not Significant	Accept Ho
c. Attitude	. 126	. 207	Not Significant	Accept Ho
d. Engagement	. 127	. 205	Not Significant	Accept Ho

Legend: At .05 level of significance.

Table 9. Relationship between the Extent of Teachers' Enthusiasm in Teaching Mathematics and Learners' Mathematics Performance

Relationship between the Extent of Teachers' Instructional Support to Learners and their Mathematics Performance

The table showed that guided practice (R-value=.005; p-value=.960), differentiated instruction (R-value=.016; p-value=.870), feedback (R-value=.137; p-value=.169), and active engagement (R-value=.049; p-value=.622) were not related to learners' mathematics performance.

It implied that relying solely on guided practice, differentiated instruction, feedback, or active engagement was not sufficient to improve mathematics performance without considering other factors. In addition, while these strategies were generally regarded as beneficial in educational settings, their direct impact on learners' mathematics achievement was limited in this study. Therefore, educators might have needed to explore additional variables or pedagogical approaches to enhance learners' mathematical understanding and skills effectively.

According to Xie et al. (2020), students' poor academic performance in Mathematics results from typical teaching methods that neither appeal to students nor develop their minds

Indicators	Correlation Coefficient (r)	p-value	Interpretation	Decision
a. Guided Practice	. 005	. 960	Not Significant	Accept Ho
b. Differentiated Instruction	. 016	. 870	Not Significant	Accept Ho
c. Feedbacking	. 137	. 169	Not Significant	Accept Ho
d. Active Engagement	. 049	. 622	Not Significant	Accept Ho

Legend: At . 05 level of significance.

Table 10. Relationship between the Extent of Teachers' Instructional Support to Learners and their Mathematics Performance

Conclusion and Recommendations

The study concluded that teachers in the selected schools exhibited high to very high enthusiasm in teaching mathematics, particularly in attitudes and engagement, which likely contributed to creating a positive classroom environment. Despite this, the findings revealed that teachers' enthusiasm did not significantly influence students' mathematical performance or perceptions of instructional support, as evidenced by the low, non-significant correlations. Similarly, instructional support strategies such as guided practice, differentiated instruction, feedback, and active engagement were generally rated as high or very high; however, these did not show a direct statistical relationship with learners' achievement levels. The results suggested that while teachers' enthusiasm and instructional support were essential for fostering motivation and engagement, they might not directly translate into improved academic performance without accounting for other factors, such as cognitive abilities, external support, and instructional quality. Furthermore, the study underscored that variables such as expressiveness, passion, attitude, and engagement remained independent of students' performance, underscoring the complexity of the factors influencing mathematics achievement. Overall, the findings emphasized the need for a multifaceted approach in mathematics instruction, integrating enthusiasm and support with targeted pedagogical strategies to effectively enhance learners' learning outcomes.

Acknowledgement

The researcher acknowledges the support and guidance of all individuals and institutions that contributed to the successful completion of this study. Appreciation was extended to the school administrators, teachers, and students in the selected private secondary schools in the City of Kabankalan for their cooperation and participation. The researcher also expressed gratitude to the subject matter experts who validated the instruments used in the research. Furthermore, acknowledgment was given to the research advisor and colleagues for their invaluable insights, encouragement, and assistance throughout

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the research process. Lastly, the researcher recognized the importance of the moral and intellectual support from family and friends that motivated the pursuit of this scholarly endeavor.

Funding

This research received no external funding from any public, commercial, or not-for-profit funding agency, and no organization provided financial support for the conduct of the study, authorship, or publication of this article.

Competing Interests Statement

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Data Availability Statement

Data sharing is not applicable to this article as no new data were created or analyzed in this study; all data used were obtained from previously published sources as cited in the reference list.

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Appendices

No appendices are attached to this study.

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