TEACHER Competence, Mathematics Motivation, and Learning Strategies of Senior High SCHOOL

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ABSTRACT

The purpose of this study is to determine the influence of teacher competence and mathematics motivation on the learning strategies of Grade 12 senior high school students of Prosperidad, Agusan del Sur. The study utilized adapted research instruments to assess the levels of teacher competence, mathematics motivation, and learning strategies. The study utilized correlation and multiple regression analysis to identify significant relationships and the combined influence of predictors on learning strategies. Results revealed that students perceived high levels of teacher competence, mathematics motivation, and learning strategies. Significant positive relationships were found between teacher competence and learning strategies and between mathematics motivation and learning strategies. However, regression analysis indicated that only mathematics motivation significantly influenced learning, whereas teacher competence had a minimal impact. The findings revealed that mathematics motivation is the only significant predictor of students' strategic learning behaviors compared to perceived teacher competence.

KEYWORDS: *Education, teacher competence, mathematics motivation, learning strategies, Philippines.*

INTRODUCTION

Learning strategies are planned and thoughtful ways in which a learner attempts to understand a concept or skill. These ways include cognitive, metacognitive, informational resource management, and non-informational resource management. These are components that facilitate effective learning. Cognitive strategies involve working directly with what students are learning to understand and remember. This may include practicing, expanding, and organizing (Pintrich & Zusho, 2014). Metacognitive strategies focus on self-regulation, including planning, monitoring, and evaluating one learning processes, which are critical for adapting to challenges and achieving goals (Dent & Koenka, 2016). Informational resource management commonly addresses knowledge deficits by identifying and utilizing external resources, such as supplementary materials, instructors, or peer assistance (Kizilcec et al., 2017). Non-informational resource management, on the other hand, entails regulating external factor such as time, effort, and the learning environment to produce ideal studying conditions (Wolters & Benzon, 2014).

Studies describing the number of students who use different learning strategies showed some empirical results. A recent international study by Broadbent and Poon (2015) found that only 42 percent of students in the four English-speaking countries (the United States, the United Kingdom, Australia, and Canada) used effective self-regulated strategies. Further, Rea et al. (2022) conducted a study of US students that revealed that only 20% to 30% of them seldom implement effective learning strategies, even when they understand their existence. The same research findings revealed a lack of defined learning strategies, such as poor self-efficacy and effort regulation. The research by Blasiman et al. (2017), also in the US, supports this outcome, as 40 percent of students often rely on inadequate strategies such as reviewing notes, even when more effective learning strategies are available. A study by Rovers et al. (2018) conducted in the Netherlands further examined the issue, revealing how concerning it is for students to identify and use learning techniques, even though these students know that these strategies exist and are well-known.

In mathematics, inefficient learning strategies among learners continue to impede academic performance in the Philippines. The issue aligns with Bernardo's (2019) study, which focuses on the preferred learning strategies of Filipino learners. It was found that many Filipino students rely mainly on rote memorization and passive learning approaches rather than on active, self-regulated strategies such as critical thinking, self-monitoring, and problem-solving. The study also indicated that more than 60 percent of senior high school students struggled to transition to metacognitive learning strategies. In addition to the study above, a parallel study conducted in the Philippines showed that 35 percent of successful students used metacognitive strategies, such as planning and self-monitoring, while 60 percent of them still struggle to transition from passive learning approaches (e.g., rote memorization) to more active, metacognitive strategies (Dela Rosa et al., 2016). The challenge was mainly due to ignorance of awareness and insufficient training in applying these techniques.

Additionally, a 2019 study by Almerino et al., conducted in parts of the Caraga Region and in Agusan del Sur, found that the learning strategies used by successful students are significantly different from those used by unsuccessful students. Among the successful students, only 30 percent used higher-order learning strategies, such as metacognitive strategies, while 70 percent still relied on basic rote memorization and other ineffective strategies. Moreover, a parallel study by Turco in 2016, conducted in Agusan del Sur, showed that only a very few, 15 percent of the students, use metacognitive learning strategies like critical thinking and self-regulation.

Various authors have identified factors that may improve students' learning strategies. These factors include teacher competence and student motivation. A study by Linsiyah et al. (2023) found a positive relationship between teacher competence and learning strategies. Additional studies further showed that teacher competence is significantly related to students' preferred learning strategies (Molina et al., 2019; Ahmed et al., 2022; Bigatel et al., 2021). Moreover, various studies have also established a significant relationship between motivation and preferred learning strategies (Kikas et al., 2024; Wigfield et al., 2015; Morgan et al., 2018).

Several existing studies focus on mixed-methods approaches to understanding the choice and utilization of preferred learning strategies (Rea et al., 2022; Balsiman et al., 2018), but only a few have attempted to draw possible directions of how factors like competence (Ingvarson & Rowe, 2018) and motivation (Zhang, 2014; Thoonen et al., 2011) affect the students' preferred learning strategies. In previous years, researchers investigated variables influencing learning strategies, such as academic success, student behavior, and self-concept (Davadas & Lay, 2020; Garcia and Sta. Maria, 2016). These research studies are most focused on individual single-variable correlational analysis, such as the relationship or effect of teacher competence and motivation. However, the interplay of these variables remains underexplored. For instance, studies highlight that teacher competence, particularly pedagogical knowledge and teaching skills, positively relates to students' learning strategies (Ingvarson & Rowe, 2018). Another study also finds that student motivation, related to teacher enthusiasm and feedback factors, significantly enhances students' learning strategies (Zhang, 2014; Thoonen et al., 2011).

This study will further focus on the combined directional effect of teachers' competence and student motivation on their learning strategies. Another focus of this research is to explore the underrepresented population of senior high school students. Some studies approached the problem of students' learning strategies qualitatively (Piland et al., 2016). Most of these studies focus on respondents from junior high school and post-secondary education, leaving inadequate representation of higher levels (Garcia-Perez, 2020; Dattathreya & Shillingford, 2017; Sylvain et al., 2016).

The study addressed critical research gaps, particularly a methodological gap in teacher competence and student motivation and a population gap arising from the limited focus on underrepresented senior high school students.

The conduct of this research is deemed urgent because it is a less-explored methodological approach, and the underrepresented educational population needs to better understand how these variables affect students' learning strategies. The study is also urgently important because it can help close a significant knowledge gap regarding how viewpoint influences instructor competency and motivation, and how these factors affect the learning strategies of sometimes less-represented research participants. As educational needs rise, there is also a considerable demand to identify functional components enhancing learning processes. The study is relevant because students need to be equipped with effective learning methods to prepare them for higher education or other career paths.

Some research has shown that learning strategies directly depend on instructor competency (Linsiyah et al., 2023; Molina et al., 2019). Few studies have also shown that motivation strongly shapes students' learning strategies (Kikas et al., 2024; Wigfield et al., 2015). Although senior high school students have often been the focus of research, the combined directional influence of teacher competence and student motivation on learning strategies remains insufficiently explored. Researchers seldom study this group as much as they do junior high school and college students (Garcia-Perez, 2020; Dattathreya & Shillingford, 2017).

Objectives of the Study. This study aimed to describe the levels of Grade 12 senior high school students' perceptions of teacher competence, mathematics motivation, and learning strategies at Prosperidad National High

School. It also assessed the extent to which each level of teacher competence and mathematics motivation correlated with learning strategies. Moreover, the investigation determined which variables significantly influence students's use of learning strategies.

Conceptual Framework. This study is anchored on the Social Cognitive Theory (Bandura, 1986), which explains that teacher competence serves as an environmental factor that shapes students' motivation and strategic learning behaviors, and the Self-Determination Theory (Deci & Ryan, 1985), which states that motivation exists along a continuum from extrinsic to intrinsic, with intrinsic motivation being the most effective in fostering deep learning and strategic engagement.

The study is also aligned with the way Himawan and Panggabean (2016) described teacher competence as a combination of professional knowledge, professional skills, personal characteristics, professional ethics and values, and professional development and lifelong learning. Moreover, the study aligns with Liu and Lin's (2010) description of mathematics motivation as a combination of components, including value, expectancy, and affect. Furthermore, Liu and Lin (2010) identified learning strategies as cognitive, metacognitive, non-informational resource management, and informational resource management. The study also presumed a significant relationship between teacher competence, mathematics motivation, and learning strategies. Hence, levels of teacher competence and mathematics motivation are the independent variables, while learning strategies are the dependent variable.

METHODS

This study utilized a descriptive-correlational design. It described whether significant relationships exist between teacher competence and learning strategies, and mathematics motivation and learning strategies.

A total of 710 respondents were selected from three purposively selected schools out of seven: 32 from School A, 69 from School B, and 49 from School C. All respondents completed their general mathematics class in 11th grade. All of them participated in the study and have given their responses.

A three-part questionnaire seeking to measure teacher competence, mathematics motivation and learning strategies was given to each respondent. The teacher's competence was measured using Panggabean and Himawan's

(2016) localized Indonesian Teacher Competence Questionnaire (ITCQ), while mathematics motivation and learning strategies were assessed using Liu and Lin's (2010) Motivated Strategies for Learning Questionnaire (MSLQ).

The first instrument that measured teacher competence has 41 items that were distributed across five indicators (professional knowledge, professional skills, personal characteristics, ethical standards and values, and professional development and lifelong learning). Furthermore, the Cronbach's alphas are 0.706 for professional knowledge, 0.787 for professional skills, 0.796 for personal characteristics, 0.732 for ethical standards and values, and 0.802 for professional development and lifelong learning. All the items in this questionnaire were rated using a five-point Likert scale: 1 – strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – agree, and 5 – strongly agree.

The second instrument that measured motivation has 36 items distributed across three indicators: value, expectancy, and affect. Furthermore, Cronbach's alphas are 0.833 for value, 0.721 for affect, and 0.691 for expectancy. All the items in this questionnaire were rated using a five-point Likert scale: 1 – strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – agree, and 5 – strongly agree.

The third instrument that measured learning strategies has 66 items across four indicators: cognitive strategies, metacognitive strategies, non-informational resource management strategies, and informational resource management strategies. Furthermore, Cronbach's alphas are 0.788 for cognitive strategies, 0.814 for metacognitive strategies, 0.811 for noninformational resource management strategies, and 0.92 for instructional resource management strategies. All the items in this questionnaire were rated using a five- point Likert scale: 1 – strongly disagree, 2 – disagree, 3 – somewhat disagree, 4 – agree, and 5 – strongly agree.

The researcher wrote a letter addressed to the Division Superintendent of the Department of Agusan del Sur, Agusan del Sur Division, for permission to conduct the study. After the superintendent's approval, the researcher coordinated with the target schools' principals to distribute the questionnaire to the respondents. The survey questionnaires were then collected, organized, and interpreted. Descriptive and inferential analyses were utilized.

The data were analyzed using various statistical tools, including mean, median, mode, Pearson's Product-Moment Correlation, and multiple regression, with a significance level of 0.05.

RESULTS and DISCUSSION

Specifically, the results in Table 1 showed that the overall mean is 3.85, which is considered high, indicating that teacher competence is often manifested. Each component of teacher competence was often perceived by students, including professional knowledge (3.96), professional skills (3.83), personal characteristics (3.72), ethical standards and values (3.87), and professional development and lifelong learning (4.04). This means that students highly perceived teachers' competence across the five indicators. For professional knowledge, all statements had a high mean, with one statement highlighted, indicating that the teacher often demonstrates mastery of the teaching materials (4.95). For professional skills, all sub-indicators had high sub-categorical means, including pedagogy (3.65), classroom management (3.76), and learner assessment (4.06). In pedagogy, almost all statements had high means, with one statement receiving the most emphasis, indicating that teachers often create ways for students to pay attention (4.04). One statement with a moderate mean showed that teaching sometimes makes students feel bored (2.86). In classroom management, all statements had high means, except one, which had a very high mean, indicating that teachers always inform students of the lesson objectives (4.28). In learner assessment, all statements had high means, except one, which had a very high mean (4.37), indicating that teachers always give quizzes and tests. For personal characteristics, almost all statements had high means, with one statement highlighting that teachers often demonstrate good behavior as role models (4.11). One statement with a moderate mean showed that the teacher sometimes repeats explanations for some slow learners (3.32). Regarding ethical standards and values, almost all statements had high means, except one that had a very high mean, indicating that teachers consistently encourage students to respect teachers and staff in school (4.46). One statement that received a moderate mean showed that teachers sometimes share students' email and phone numbers (2.84). Finally, for professional development and lifelong learning, all statements had high means, with one statement highlighted, indicating that teachers often encourage students' improvement to promote lifelong learning (4.12).

The overall high mean of 3.85 indicates that students often perceive teachers' competence. The findings imply that teachers demonstrate strong subject expertise and effective classroom strategies, though diversifying teaching methods could enhance engagement. While fairness and enthusiasm are evident, tailored support for varied learning paces and clearer communication boundaries would strengthen equity and professionalism. Encouraging lifelong learning is prominent, yet integrating broader perspectives could further enrich student experiences, highlighting opportunities to refine instructional flexibility and holistic engagement. These findings collectively support a strong foundation of competency while emphasizing avenues to enhance educational flexibility, equity, and comprehensive student participation.

Initially, the results are consistent with those of Panggabean and Himawan (2016), showing that students have high perceptions of their teachers' competence across domains such as professional knowledge, professional skills, personal characteristics, ethical standards and values, and professional development and lifelong learning. The findings of this study supported those of Fernandez-Garcia et al. (2019), who found that students' perceptions of their teachers' teaching competence ranged from sufficient to good across various categories. These findings supported the study by Spooren et al. (2017), showing that students generally perceive teachers as highly competent, particularly when instructors demonstrate strong pedagogical skills and approachability. Another study by Wang et al. (2021) congruently showed that students view their teachers as holistically competent.

Specifically, the results in Table 2 showed that the overall mean is 3.62, which is considered high, indicating that students' mathematics motivation is often demonstrated. The students often demonstrated all components of mathematics motivation, including value (3.71), expectancy (3.83), and affect (3.53). This means that students demonstrated strong motivation in mathematics across three indicators. For value, all sub-indicators had high sub-categorical means, including intrinsic goal orientation (3.90), extrinsic goal orientation (3.54), and task value (3.70). In intrinsic goal orientation, all statements had high means, except one, which had a very high mean, indicating that students always wish to understand the content of the math learning materials (4.24). In extrinsic goal orientation, almost all statements had high means, with one statement highlighting that students often desired the best grades in mathematics class (4.12). One statement that received a moderate mean showed that students sometimes get high scores in math for recognition (2.97). In task value, almost all statements had high means, with one statement highlighting that students often apply skills learned in mathematics class in other subjects (3.79). One statement with a moderate mean showed that students sometimes enjoy all the topics and content in math class, which increases engagement. For expectancy, all sub-indicators had high sub- categorical means, including control beliefs for learning (3.68) and self-efficacy (3.50). In control beliefs for learning, all statements had high means, with one statement highlighting that students often have enough time to practice mathematics to improve their skills (4.08). In self-efficacy, all statements had moderate means, with one statement highlighting that students sometimes believe in their ability to achieve excellent grades in mathematics, which boosts their confidence (3.39). Affect, which only has test anxiety as its sub-indicator, got a high sub-categorical mean of 3.53. Almost all statements had high means, with one statement highlighting that students often feel nervous and worried during exams, which interferes with their performance (3.82). One statement that got a moderate mean showed that students sometimes think they are inferior to other classmates during math exams, which increases their anxiety (3.10).

The overall high mean of 3.62 showed that students often demonstrate their mathematics motivation. The result implies that students place a high value on mathematics because they understand how it can improve logical thinking, foster interdisciplinary connections, and be applied to real-world problems. However, a lack of enthusiasm for some topics and occasional disinterest in engaging fully with all subject areas point to a disconnect between abstract ideas and their personal importance. Emphasizing math's social contributions and aligning courses with students' daily lives will strengthen contextualized learning experiences and close this gap, thereby promoting greater intrinsic satisfaction and ongoing curiosity across numerous mathematical fields.

The finding on mathematics motivation appears to be parallel with the results of Benden et al. (2023), showing that most students have a high level of mathematics value expectancy. Another study by Fong et al. (2020) supported these findings by showing high levels of math motivation, which included both expectancy and value components. The result supported the study by Gaspard et al. (2015), which found that value is the perceived relevance of mathematics to students' daily lives and future aspirations. Their classroom intervention highlighted real-world applications of math, such as budgeting and problem-solving, thereby significantly enhancing students' utility-value beliefs and course enrollment intentions. Additionally, the study by Watt et al. (2012) found that boys and girls equally valued math's utility, but male students reported higher attainment value, which influenced their sustained participation in advanced math courses.

Specifically, the results in Table 3 showed that the overall mean is 3.52, which is considered high, indicating that students' use of learning strategies is often demonstrated. The use of each component of learning strategies was often demonstrated by the students, including cognitive learning strategies (3.76), metacognitive learning strategies (3.66), non-informational resource management (3.51), and informational resource management (3.24). This result indicates that students demonstrated a high level of use of different learning strategies across the four indicators. For cognitive learning strategies, all sub-indicators had high sub-categorical means, including rehearsal (3.84), elaboration (3.73), and organization (3.75). In rehearsal, all statements had high means. One statement was highlighted, indicating that students often memorize key math formulas to recall important concepts from class (3.97). In elaboration, all statements had high means, with one statement highlighting that students often combine prior knowledge with new math materials to support their deep learning (3.81). In the organization, all statements had high means, with one statement highlighting that students often read through their notes and textbooks to identify key parts that will help their review process (3.88). For metacognitive learning strategies, all sub-indicators had high sub-categorical means, including critical thinking (3.61) and self- regulation (3.71). In critical thinking, all statements had high means, with one statement highlighted, showing that students often explore alternative solutions to problems in math class, which promotes creative problem-solving (3.78). In self-regulation, all statements had high means, with one statement highlighting that students often review their answers after completing a math question to ensure accuracy (3.95). For non-informative resource management, all sub-indicators had high subcategorical means, including effort regulation (3.61), time and study environment (3.37), peer learning (3.38), and help- seeking (3.71). In effort regulation, almost all statements had high means, with one statement highlighting that students often pay attention in class despite low math scores, demonstrating dedication to improvement (4.10). One statement with a moderate mean showed that students sometimes give up when materials are difficult (2.71). In terms of time and study environment, almost all statements had moderate means, with one statement receiving a high mean, indicating that students often clean their desks before studying to help them concentrate better (3.72). One statement that got the lowest moderate mean showed that students sometimes make studying math a fixed-time habit to increase routine discipline (3.15). In peer-learning, almost all statements had high means, with one statement highlighting that students often collaborate with classmates on math homework to reinforce their learning (3.66). One statement with a moderate mean showed that students sometimes compete with classmates in math to motivate themselves to improve their performance (2.81). In help-seeking, almost all statements had high means, with one statement highlighting that students often ask the teacher for help to clarify confusion in math concepts and improve understanding (3.92). One statement with a moderate mean showed that students sometimes solve difficult math problems independently to develop their problem-solving skills (2.92). For informational resource management, all sub-indicators got moderate sub-categorical means, such as exploratory behavior on the internet (3.37) and communication behavior on the internet (3.71). In exploratory internet behavior, almost all statements had moderate means, with one statement receiving a high mean, indicating that students often visit new math-related websites to stay up to date with the latest resources (3.47). One statement that received the lowest moderate mean stated that students sometimes take online math tests to assess their skills and track their progress (3.24). In communication behavior on the internet, almost all statements had moderate means, with one statement receiving a high mean, indicating that students often ask math questions on Google's knowledge graph, which provides access to helpful information (3.52). The statement that received the lowest moderate mean showed that students sometimes email their teacher with math questions to clarify their doubts (2.80).

The overall high mean of 3.54 indicated that students often used various learning strategies. The result indicates that students exhibit a high level of employing cognitive and metacognitive strategies, including self-regulated planning, elaboration, and rehearsal, to improve their retention and problem-solving abilities. Limited systematic organization and technology integration are evident in limited engagement in non-informational resource management, such as structured time management and optimal study surroundings, and in informational resource management, such as effective digital tool use. Educators should emphasize blending core cognitive processes with resource-optimization training to cultivate holistic, self-directed learners in both traditional and digital learning environments.

The result is consistent with Liu and Lin (2010), showing that students used a variety of learning strategies across cognitive, metacognitive, non-informational resource management, and informational resource management. The finding generally supported the results of the study by Broadbent et al. (2015), which found that students often use learning strategies across categories, such as cognitive, metacognitive, and resource management strategies. This also supported the study by Jansen et al. (2019), showing that students consistently use cognitive, metacognitive, and resource management learning strategies.

Table 4 presents the results of the significance tests for the relationships among teacher competence, mathematics motivation, and learning strategies. The data reveal a low positive relationship between teacher competence and learning strategies, as reflected in the r-value of 0.395. The low positive correlation between teacher competence and learning strategies can be attributed to the underexplored interplay between institutional expectations of teacher performance and students' autonomous adoption of learning strategies. Even though professional knowledge, classroom management, and moral standards are all part of a teachers' skill set, they may not directly affect how students learn strategically. Additionally, the results show that the relationship between teacher competence and learning strategies is significant, as reflected in the p-value of < 0.05. The minimal p-value (less than 0.001) suggests a statistically significant, though modest, relationship between how competent teachers are regarded and how students approach learning. Hence, the observed link between teacher competence and learning strategies is highly unlikely to be a coincidence. Moreover, the data reveal a moderate positive relationship between mathematics motivation and learning strategies, as reflected in the r-value of 0.596. It indicates that mathematics motivation, encompassing value, expectancy, and affect, aligns more closely with learning strategies, underscoring that students' internal drive and perceived relevance of the subject matter are more pivotal in shaping their strategic engagement. Additionally, the relationship between mathematics motivation and learning strategies is significant, as indicated by the p-value of < 0.05. The small p-value (< 0.001) strongly suggests that the relationship between students' math motivation and their use of learning strategies is not random.

The above result is consistent with the findings of Mega et al. (2014), which show a direct positive relationship between students' mathematics motivation and their learning strategies. Moreover, Schukajlow et al. (2017) recently found that students' mathematics motivation, such as interest in problem-solving, is significantly related to their use of cognitive strategies, such as breaking complex problems into smaller parts, and to their management of informational resources, such as peer discussions. Additionally, the results are parallel to those of the study by Areepattamannil and Khine (2017), which shows a moderate positive correlation between mathematics motivation and preferred learning strategies. Overall, the results presented above unanimously support Lau's (2020) conceptual statement that students' intrinsic motivation in mathematics, such as valuing the subjects' relevance or enjoying problem-solving, tends to align with their adoption of adaptive learning strategies.

Table 5 presents the results of a multiple regression analysis that assesses the significance of teacher competence and mathematics motivation in predicting learning strategies. The regression analysis reveals that mathematics motivation significantly predicts learning strategies ($\beta = 0.538$, $p < .001$), indicating a strong positive influence, while teacher competence does not reach statistical significance ($\beta = 0.110$, $p = 0.067$). The results reveal that mathematics motivation significantly influences students'learning strategies, with a p-value below the 0.05 level of significance and a strong positive standardized beta of 0.526. This indicates that for every unit increase in mathematics motivation, there is a corresponding increase of 0.526 in learning strategies. The statistical findings indicate that the students' own motivation to learn mathematics, such as persevering through challenges, discovering personal value in the subject, or setting goals, has a significantly greater impact on their utilization of effective learning strategies, such as reviewing notes, linking concepts to real life, or organizing study time, than the teachers' competence alone does. A strength meter might be thought of as the motivation beta value (0.538). This value indicates that a students' adoption of strategic learning habits increases by more than half a unit for every unit increase in the students'motivation. On the other hand, the smaller beta value of 0.110 for teacher competency suggests that its direct influence is weaker, even if teachers are skillful. While teacher competence is critical to classroom quality, it did not directly lead students to adopt these strategies. Nonetheless, teacher skill may still indirectly enhance motivation, for example, through captivating lessons or mentorship, which future research might investigate. Regarding the regression model, the R- squared value of 0.364 indicates that teacher competence and mathematics motivation contributed significantly to learning strategies, accounting for 36.4 percent of the total variability. The R^2 value (0.364) indicates that about 36 percent of the variation in students' use of these strategies can be explained by their motivation and teachers'competence combined. However, we must note that mathematical motivation undeniably drives that 36 percent. Emphasizing this aligns with the data and provides actionable insight: boosting student motivation, such as through relevance, autonomy, or goal-setting, will likely yield stronger returns in strategic learning than focusing solely on teacher competence. The remaining 64 percent likely comes from other factors not measured here, such as family support, peer interactions, or access to learning tools. Therefore, the 63.2 percent difference can be attributed to other variables not included in this study. The p-value of 0.001, which is less than the 0.05 level of significance, further shows a significant impact of the teachers'competence and mathematics motivation on the learning strategies.

The finding above is parallel to the study of Khatoon and Mahmood (2020), which showed that motivation directly strengthens metacognitive reflection and collaborative learning in mathematics. It was found in the study that math motivation has accounted for 29 percent of the variance in metacognitive strategies ($\beta = 0.47$, $p < .001$) and 18 percent in peer collaboration ($\beta = 0.31$, $p < .01$). The result also agrees with the study of Yan and Lin (2021), which shows that intrinsic motivation enhances both strategic learning behaviors and willingness to seek support in mathematics. Furthermore, the study by Lee and Stankov (2018) found that mathematics motivation significantly predicted metacognitive strategies ($\beta = 0.24$, $p < .001$) and time management ($\beta = 0.18$, $p < .01$) after controlling for prior achievement. This is supported by Jansen et al. (2019), who found that students with higher math motivation engage more frequently in active cognitive strategies and persist in the face of challenges.

Overall, the study revealed that both teacher competence and mathematics motivation are perceived as high among students, with overall means of 3.85 and 3.62, respectively. Teacher competence consistently ranked strongly across domains such as professional knowledge, ethical standards, and lifelong learning, though pedagogical diversity and personal engagement received less emphasis. A motivation framework structured around value (intrinsic/extrinsic goals and task relevance), expectancy (control beliefs and self-efficacy), and affect (test anxiety) showed that students are driven by internal goals and effort but face challenges with self-confidence and exam-related stress. Learning strategies were frequently utilized in cognitive and collaborative practices but lagged in metacognitive reflection, time management, and digital resource use. Notably, mathematics motivation emerged as a stronger predictor of learning strategies ($\beta = 0.538$, $p < 0.001$) than teacher competence ($\beta = 0.110$, $p = 0.067$), underscoring motivations' critical role in shaping strategic learning behaviors.

To address these findings, targeted interventions are recommended. For teachers, professional development programs should prioritize innovative pedagogies like project-based learning and differentiated instruction to enhance engagement and instructional variety. Students would benefit from confidence-building initiatives, such as low-stakes assessments and peer mentoring, alongside stress- management workshops to mitigate test anxiety. Integrating metacognitive training (e.g., goal-setting templates, error-analysis exercises) and digital literacy tools (e.g., gamified platforms like Kahoot!) into curricula can help bridge gaps in the application of learning strategies. Schools should leverage gamified apps (e.g., Prodigy Math) and real-world projects to sustain motivation, while districts and policymakers should foster partnerships with ed-tech developers and industries to align math education with practical applications. Finally, exploring combined teacher-training models that blend competency-building with autonomy-supportive frameworks can create classrooms where motivation and effective strategies thrive in synergy.

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