



MÉTILEDTEĐ: International Multidisciplinary Journal in Language, Education, and Culture

www.metiledtedjournal.com

Internal-External Learning Factors and Student Engagement in Mathematics Grade 7

DOI: <https://doi.org/10.5281/zenodo.20512964>

Authors:

¹Jurey P. Deatras, LPT
Tacurong National High School

²Leodie D. Mones, PhD
East-West Mindanao Colleges, Inc

Publication History:

Date Submitted: April 20, 2026
Date Accepted: April 21, 2026
Date Reviewed: April 22, 2026
Date Revised: May 31, 2026
Date Published: June 03, 2026

How to cite this work:

Deatras, J., & Mones, L. (2026). Internal-External Learning Factors and Student Engagement in Mathematics Grade 7. *MÉTILEDTEĐ: International Multidisciplinary Journal in Language, Education, and Culture*, 2(18), 578–590. <https://doi.org/10.5281/zenodo.20512964>

ABSTRACT

Student engagement in mathematics is a crucial determinant of academic success, particularly in junior high school, where foundational skills are established. This quantitative descriptive-correlational study examined the relationship between internal and external learning factors and mathematics engagement of Grade 7 students in selected secondary schools in Tacurong City. Findings revealed that while students exhibited relatively high levels of motivation and responded positively to teaching methods, study habits and peer influence were only moderately observed. This indicates that many students lack consistent independent study routines and seldom engage in collaborative learning with classmates. In terms of engagement, students demonstrated moderate overall levels, with behavioral and cognitive engagement classified as “Merely Engaged,” reflecting inconsistent participation, attention, and limited use of problem-solving strategies. Emotional engagement, however, was higher, suggesting students enjoy learning mathematics and experience positive feelings when solving problems. Correlation analysis further showed that study habits had the strongest positive relationship with mathematics engagement, whereas motivation, teaching methods, and peer influence exhibited inconsistent or negligible correlations. Collectively, internal and external learning factors had minimal predictive effect on overall engagement. These findings highlight the need for a balanced approach to enhancing mathematics learning, emphasizing the cultivation of disciplined study practices and supportive peer collaboration alongside motivation and effective teaching. Interventions that strengthen self-regulated learning behaviors and promote active participation are critical to translating students’ positive attitudes into consistent academic performance and problem-solving proficiency.

Keywords: self-regulation, collaborative learning, academic behavior, problem-solving



INTRODUCTION

Background of Study

Student engagement in mathematics is widely recognized as a critical determinant of academic achievement, particularly at the junior high school level, where foundational mathematical skills are developed. During this period, many learners begin to experience reduced interest, low confidence, and decreased classroom participation. These challenges are shaped by a combination of internal factors, including motivation, academic self-efficacy, attitudes, and study habits, and external factors such as teacher support, classroom climate, peer influence, parental involvement, and availability of learning resources.

International studies emphasize that both internal learning factors—such as motivation, self-efficacy, and metacognitive strategies—and external learning factors, including instructional practices, classroom climate, and social interaction, significantly influence students' behavioral, cognitive, and emotional engagement in mathematics; however, many global studies focus on generalized middle-school populations rather than specific entry-level grades like Grade 7, creating a gap in understanding early secondary engagement patterns (Sen, 2022; Istijanto et al., 2024).

In the Philippine context, recent research underscores the role of interactive teaching strategies, learning environments, and peer collaboration in enhancing student engagement; however, studies aggregate data across multiple grade levels or emphasize academic performance over engagement as a multidimensional construct, leaving Grade 7 mathematics learners underrepresented (Roque, 2025). Within South Central Mindanao, studies conducted in South Cotabato highlight the influence of contextual factors such as classroom resources and teacher-led strategies on students' engagement and performance; investigations rarely integrate internal learner attributes alongside external school-related factors in a single analytical framework (Mallo, 2025).

At the provincial level of Sultan Kudarat, existing literature remains sparse, with limited empirical evidence examining how internal and external learning factors jointly shape Grade 7 students' engagement in mathematics, thereby constraining the development of localized, data-driven interventions. Addressing this gap supports Sustainable Development Goal 4, which calls for inclusive, equitable, and quality education through improved learning outcomes and supportive learning environments (United Nations, 2025). Hence, this study aims to examine the relationship between internal–external learning factors and student engagement in mathematics among Grade 7 learners in selected secondary schools in Tacurong City, Sultan Kudarat, to generate context-specific evidence to inform instructional practices and educational policy aligned with SDG 4.



Statement of the Problem

The study sought to determine the relationship between internal-external learning factors and student engagement in Grade 7 mathematics among selected public secondary schools in Tacurong City.

Specifically, it aimed to answer the following questions:

1. To what extent is the observance of internal and external learning factors of Grade 7 students in mathematics, in terms of:
 - 1.1 Motivation;
 - 1.2 Study habits;
 - 1.3 Teaching methods; and
 - 1.4 Peer influence?
2. What is the level of mathematics engagement of Grade 7 students among selected secondary schools in Tacurong City division, in terms of:
 - 2.1 Behavioral engagement;
 - 2.2 Emotional engagement; and
 - 2.3 Cognitive engagement?
3. Is there a significant relationship between the observance of internal-external learning factors and student engagement in mathematics grade 7?

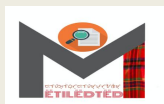
METHODOLOGY

Research Design

This study used a quantitative descriptive-correlational research design to understand how internal-external learning factors relate to the mathematics engagement of Grade 7 students among secondary schools in Tacurong City. Instead of changing classroom conditions, the study simply gathered information about motivation, study habits, teaching methods, and peer influence, then examined how these naturally occurring factors connect to their behavioral, emotional, and cognitive engagement in math. Using a structured survey, the study aimed to capture the real experiences of learners and identify meaningful patterns that can help teachers, parents, and the school better support students in strengthening their engagement in mathematics.

Respondents of the Study

The respondents were one hundred thirty-six (136) Grade 7 students selected using proportionate random sampling from five public secondary schools in the Schools Division Office (SDO) of Tacurong City.



Sampling Technique

This study used a proportionate random sampling. Specifically, ten percent (10%) of the total population from each of the five (5) selected schools in the Tacurong City Division was taken as respondents.

The number of participants per school was determined by computing 10% of the total population in each respective school to ensure fair representation.

After identifying the required number of respondents, participants were selected through random sampling to avoid bias and to give an equal chance for all included in the study.

This approach ensured that the sample was representative of the population across the different schools while maintaining manageable data collection.

Data Gathering Instrument

This study employed a researcher-made survey questionnaire using a five-point Likert scale, which was evaluated and validated by a panel of experts. Prior to the full implementation, the instrument underwent pilot testing to assess clarity, relevance, and comprehensibility of the items. A reliability test was also conducted to determine the internal consistency of the questionnaire, ensuring that the instrument was both valid and reliable for data collection.

To assess the extent of observance of internal and external learning factors of Grade 7 students in mathematics, the scale below was used:

Scale	Range	Verbal Description	Interpretation
5	4.21 – 5.00	Strongly Agree	Highly Observed
4	3.41 – 4.20	Agree	Observed
3	2.61 – 3.40	Neutral	Moderately Observed
2	1.81 – 2.60	Disagree	Slightly Observed
1	1.00 – 1.80	Strongly Disagree	Not Observed

While, students' engagement in mathematics such as behavioral engagement, emotional engagement, and cognitive engagement, was rated through the scale below.



Scale	Range	Verbal Description	Interpretation
5	4.21 – 5.00	Strongly Agree	Highly Engaged
4	3.41 – 4.20	Agree	Engaged
3	2.61 – 3.40	Neutral	Merely Engaged
2	1.81 – 2.60	Disagree	Slightly Engaged
1	1.00 – 1.80	Strongly Disagree	Not Engaged

Data Gathering Procedure

To ensure reliable and authentic findings, the researcher adhered to a methodology aligned with the study to examine the relationship between internal and external learning factors and student engagement in Grade 7 mathematics among selected secondary schools in Tacurong City for the school year 2025-2026.

Initially, the study's implementation required the endorsement of both the Superintendent of DepEd – City Schools Division of Tacurong City and the Dean of the College of Graduate Studies (CGS). An additional letter of authorization was dispatched to the school principals of different secondary schools in Tacurong City. To ensure the accuracy of the data collected for this study, a survey form was utilized, developed, and assessed.

The researcher used a proportionate random sampling to ensure representation across different classes/sections of Grade 7 students. Before the conduct, the research proposal underwent ethical considerations. The researcher sought clearance from the EWMCI Research Ethics Committee (E-REC). The researcher initiated the face-to-face dissemination of the survey form, provided that the health protocol was adhered to.

Scope and Delimitation of the Study

This study examined how internal learning factors (such as motivation, study habits) and external learning factors (including teaching methods, peer influence) influenced Grade 7 students' engagement in mathematics.

The study covered students who enrolled in Grade 7 during the current school year and analyzed their level of engagement in mathematics in terms of behavioral, emotional, and cognitive aspects.



Data gathered through researcher-designed questionnaires was analyzed to determine the relationship between internal and external factors and student engagement.

This study was limited to Grade 7 students at the Schools Division Office of Tacurong City and did not include students from other grade levels in other schools divisions. The research focused solely on mathematics and did not explore engagement in other subject areas.

The study considered only the factors identified by the researcher; other possible influences on mathematics engagement (such as mental health, socio-economic status, or learning disabilities) were not included.

RESULTS AND DISCUSSIONS

Student engagement in mathematics is widely recognized as a critical determinant of academic achievement, particularly at the junior high school level where foundational mathematical competencies are developed. Engagement is not a single-dimensional construct but is generally understood to include behavioral, emotional, and cognitive components that interact to influence learning outcomes (Fredricks et al., 2020; Reeve, 2022). In the context of the 21st-century classroom, student engagement is further shaped by both internal factors (such as motivation, interest, and study habits) and external factors (such as teaching strategies, peer influence, and classroom environment), all of which contribute to how learners participate in and respond to instruction (OECD, 2021). This study employed a quantitative descriptive-correlational research design to examine the relationship between internal and external learning factors and the mathematics engagement of Grade 7 students in selected secondary schools in Tacurong City Division.

Level of Internal and External Learning Factors

The findings revealed that the internal and external learning factors influencing students' mathematics learning were generally at a moderate level. Among the variables examined, motivation and teaching methods were rated relatively higher, indicating that students showed reasonable interest in learning mathematics and perceived instructional strategies as clear, structured, and supportive. This aligns with the view that teacher clarity, feedback, and instructional quality are strong predictors of student engagement in mathematics classrooms (Hattie, 2021; OECD, 2021).

In contrast, study habits and peer influence were moderately observed, suggesting that many students lacked consistent independent learning routines and limited collaborative academic interaction. Similar findings were reported by Wang and Eccles (2020), who emphasized that weak self-regulated learning behaviors and insufficient peer academic engagement often hinder sustained student involvement in mathematics tasks. Likewise, Zimmerman and Kitsantas (2021) noted that effective study habits, particularly self-monitoring and time management, are strongly associated with higher engagement and achievement in mathematics.



Level of Mathematics Engagement

The results showed that Grade 7 students exhibited a moderate level of mathematics engagement overall. This suggests that while students are not disengaged, their participation and depth of learning remain inconsistent across engagement dimensions.

In terms of behavioral engagement, students were generally “merely engaged,” indicating inconsistent participation, attention, and task completion. This reflects findings from Jang et al. (2021), who argued that behavioral engagement is highly sensitive to classroom structure and instructional demands, and often declines when learning tasks lack relevance or scaffolding.

Emotional engagement was comparatively higher, falling under the “engaged” category, suggesting that students generally enjoyed mathematics lessons and experienced positive affect during problem-solving activities. This is consistent with Reeve (2022), who emphasized that emotional engagement is strongly influenced by teacher support, autonomy support, and classroom climate.

However, cognitive engagement was again rated as “merely engaged,” indicating limited use of higher-order thinking skills such as reasoning, problem-solving strategies, and self-regulated learning. This finding aligns with OECD (2023), which reported that many learners struggle with deep mathematical reasoning when instruction remains procedural rather than conceptual. It also supports the assertion of Boaler (2022) that meaningful mathematical understanding requires opportunities for exploration, reasoning, and conceptual dialogue rather than rote computation.

Correlation Between Learning Factors and Mathematics Engagement

The correlation analysis revealed that among the internal and external learning factors, study habits had the strongest positive relationship with mathematics engagement. This finding highlights the critical role of self-regulated learning in sustaining engagement, as students who consistently review lessons, practice problems, and manage their study time are more likely to participate actively in mathematics learning (Zimmerman & Kitsantas, 2021; Schunk & DiBenedetto, 2020).

Other factors, such as motivation, teaching methods, and peer influence, showed inconsistent or negligible correlations with engagement. This suggests that while these variables may contribute to learning in isolation, their effects are not strong enough to independently predict engagement in this context. According to Fredricks et al. (2020), student engagement is a multidimensional construct influenced by the interaction of multiple contextual and personal factors rather than a single determinant.



Overall, the combined internal and external learning factors demonstrated little direct predictive effect on mathematics engagement. This finding implies that engagement is a complex phenomenon that may be better explained by mediating variables such as self-efficacy, mindset, or classroom climate rather than by isolated learning factors alone. Hattie (2021) similarly emphasized that the strongest predictors of student learning often lie in the quality of feedback, teacher-student relationships, and students' self-regulatory capabilities.

In summary, the findings suggest that while Grade 7 students demonstrate moderate engagement in mathematics, there remains a need to strengthen cognitive engagement and study habits through more structured instructional support, learner-centered pedagogy, and strategies that promote deeper mathematical thinking.

Conclusion

The following conclusions were made in light of this study's findings:

Enhancing mathematics learning among Grade 7 students requires a balanced approach that strengthens both internal and external learning factors.

While teacher support and student motivation provide a positive foundation for learning, fostering disciplined study practices and encouraging meaningful peer collaboration may further improve students' engagement, independence, and academic performance in mathematics.

Also, while students are emotionally motivated in mathematics, their actual behaviors and cognitive involvement require further support. Educators may need to implement strategies that promote active participation and higher-order thinking to translate positive attitudes into sustained learning and problem-solving proficiency.

Finally, it has been concluded that while motivation and teaching strategies are important, cultivating consistent study habits remains the most influential factor in promoting active engagement in mathematics, highlighting the need for interventions that strengthen students' self-regulated learning behaviors.

Recommendations

In light of the findings of the study, the following were recommended:

1. DepEd and School Administrators may prioritize programs that strengthen students' study habits, such as structured after-class study sessions or homework clubs, and encourage initiatives that promote collaborative learning among classmates. Providing resources and spaces where students can work together safely and productively will help transform peer influence from minimal to meaningful.

2. Curriculum Planners may integrate activities that foster independent learning and peer collaboration into the mathematics curriculum, such as project-based tasks, problem-solving



challenges in groups, and guided reflection exercises. Embedding structured opportunities for practice outside traditional lectures can improve both behavioral and cognitive engagement.

3. Teachers may actively model and support self-regulated learning strategies, including note-taking, reviewing lessons, and planning study schedules. Encourage peer tutoring, collaborative problem-solving, and math clubs to promote a supportive learning environment where students learn from and motivate one another.

4. Future Researchers may investigate innovative interventions targeting study habits and peer-supported learning, such as gamified study routines, peer mentorship programs, or digital collaboration tools, to explore effective ways of enhancing mathematics engagement among Grade 7 learners.

Ethical Considerations

In preparation for implementation, all the plans and recommendations were presented to East-West Mindanao Colleges, Inc. to ensure compliance with prescribed procedures and protocols. In examining the relationship between internal and external learning factors and student engagement in Grade 7 mathematics, it was imperative to emphasize the paramount importance of ethical considerations. Before commencing this study, the following ethical principles were highlighted:

Informed Consent. Before participation, consent was obtained from all school heads involved in the study. They must possess a comprehensive understanding of the study's objectives, methodologies, potential risks, and benefits. Furthermore, participation remained entirely voluntary, allowing the participants to withdraw from the study at any juncture without adverse consequences.

Anonymity and Confidentiality. To safeguard identities and responses, rigorous measures were followed to ensure anonymity and confidentiality. Rather than using actual names, pseudonyms or codes were used to uphold the participants' privacy. The collected data was securely stored with access restricted solely to the research team.

Avoiding Harm. Delicate subjects, such as the challenges inherent in their roles, were discussed with potential emotional and psychological impact on participants. Strategies were in place to minimize distress, and a support system was readily available to assist participants.

Researcher-Participant Relationship. The researcher maintained a professional and respectful rapport when engaging with the school heads. Any actions that might harm the participants were scrupulously avoided, ensuring their utmost dignity and respect throughout the research process.

Data Protection. Adherence to data protection regulations and laws was observed to safeguard the participants' personal information. Stringent measures were employed to ensure the secure storage and transmission of data.



MÉTILEDTÈD: *International Multidisciplinary Journal in Language, Education, and Culture*

www.metiledtedjournal.com

Voluntary Participation. Participants were assured that their participation in the study was devoid of any coercion or external pressure.

Researcher Bias. The researcher remained vigilant regarding potential biases that might influence data collection and analysis, upholding objectivity and transparency throughout the research endeavor.

Institutional Approval. Before initiating the study, the researcher sought ethical clearance from the pertinent institutional review boards or ethics committees.

Honesty and Integrity. The research findings were reported truthfully and accurately, free from manipulation or distortion to align with preconceived notions or biases.

Beneficence. The potential benefits of the research in educational practices and policies were thoughtfully considered, ensuring that the study contributes to the education system.

Cultural Sensitivity. The researcher demonstrated cultural sensitivity by respecting local customs, beliefs, and practices within the research setting and refraining from imposing external values on participants.

Inclusion and Diversity. The study's structure prioritized inclusivity and diversity, encompassing a wide spectrum of internal and external learning factors and student engagement in Grade 7 mathematics among selected secondary schools in Tacurong City.

Acknowledgment

The researcher would like to express his sincerest appreciation to all those people who helped to make this research a success. With sincere respect, appreciation, and honor, he thanks the following people for their support:

LEODIE D. MONES, PhD, research adviser, for his scholarly guidance, insightful recommendations, and steadfast support throughout the conduct of this study. His expertise and leadership have been instrumental in the successful development of this research.

JAIME BOY U. NGAG JR., PhD, and **AMILUDIN G. MASABPI, PhD**, the members of the panel, for their constructive criticisms, valuable suggestions, and academic rigor, which significantly enhanced the quality of this study.

JULIET P. TAMBUNGALAN, MAED, GS Program Consultant, for her unwavering support, encouragement, and guidance in making this study a success.



MĚTILĚDTĚD: *International Multidisciplinary Journal in Language, Education, and Culture*

www.metiledtedjournal.com

EMILIA M. LOTILLA, PhD, Dean of the Graduate School Department, for her constant encouragement, motivation, and leadership, which motivated the researcher to continue and finish this endeavor.

BAILAH B. SANDIGAN, MAED, President of East-West Mindanao Colleges, Inc., for providing an academic environment that fosters growth and excellence.

GILDO G. MOSQUEDA, CEO VI, SDS of Tacurong City Division, for authorizing the conduct of the study in the Division and for all the care and support in undertaking this pursuit.

MICHAEL A. POBLADOR, PhD, language critic, for his insightful comments, careful assessment, and experience in improving the linguistic precision and academic excellence of this research. His input was indispensable in maintaining the quality and integrity of this study.

EAST-WEST MINDANAO COLLEGE, INC., for granting the available resources, learning environment, and institutional assistance that significantly facilitated the uneventful execution of this study.

RESPONDENTS, for their active participation, time, and valuable contributions, which were essential in the completion of this study.

BELOVED SIBLINGS, for their ever-present encouragement, inspiration, and moral support, which have been a source of strength throughout this endeavor. Their presence and faith in the researcher's abilities have encouraged him to continue.

MELANIE A. DEATRAS, the researcher's loving wife, for her patience, understanding, and unwavering support during this endeavor. Her words of encouragement have been a source of strength and inspiration in the midst of adversity.

ZANDER NATHAN A. DEATRAS AND HANS JACOB A. DEATRAS, the researcher's beloved sons, for being his biggest source of inspiration.

First and foremost, **ALMIGHTY GOD**, for His guidance, wisdom, and unlimited blessings, without which this would not have been possible. His divine mercy has been the be-all and end-all source of strength along the way on this academic endeavor.

Declaration AI Tools Utilization

I do hereby declare the use AI tools, such as Chat GPT and Grammarly for grammar checking and sentence organization purposes only.



REFERENCES

- Boaler, J. (2022). *Mathematical mindsets: Unleashing students' potential through creative math*. Wiley.
- Fredricks, J. A., Hofkens, T., Wang, M. T., & Scott, P. (2020). Supporting student engagement in mathematics classrooms. *Educational Psychologist*, 55(2), 73–89. <https://doi.org/10.1080/00461520.2019.1705202>
- Hattie, J. (2021). *Visible learning: The sequel*. Routledge. <https://doi.org/10.4324/9781003176053>
- Istijanto, I., Handayani, P. W., Ainy, R. N., & Hidayanto, A. N. (2024). Factors influencing student engagement in mathematics learning: The roles of motivation, self-efficacy, and classroom environment. *Education Sciences*, 14(2), 187. <https://doi.org/10.3390/educsci14020187>
- Jang, H., Kim, E. J., & Reeve, J. (2021). Why students become more engaged or disengaged in mathematics. *Journal of Educational Psychology*, 113(4), 645–660. <https://doi.org/10.1037/edu0000535>
- Mallo, J. P. (2025). Classroom resources, instructional strategies, and mathematics engagement among junior high school students in South Cotabato. *Philippine Journal of Educational Research*, 18(1), 45–62.
- OECD. (2021). *21st-century learners: Student engagement and learning outcomes*. OECD Publishing. <https://doi.org/10.1787/9789264442567-en>
- OECD. (2023). *PISA 2022 results (Volume I): The state of learning and equity in education*. OECD Publishing. <https://doi.org/10.1787/53f23881-en>
- Reeve, J. (2022). *Understanding motivation and engagement in education*. Springer. <https://doi.org/10.1007/978-3-030-84604-4>
- Roque, M. A. (2025). Interactive teaching strategies and student engagement in mathematics among secondary school learners in the Philippines. *Asian Journal of Education and Social Studies*, 54(2), 115–129. <https://doi.org/10.9734/AJESS/2025/v54i2456>
- Schunk, D. H., & DiBenedetto, M. K. (2020). Motivation and social cognitive theory. *Contemporary Educational Psychology*, 60, 101832. <https://doi.org/10.1016/j.cedpsych.2019.101832>



MÉTILÉDTËD: International Multidisciplinary Journal in Language, Education, and Culture

www.metiledtedjournal.com

Sen, S. (2022). The relationship between mathematics self-efficacy, motivation, and student engagement in secondary education. *International Journal of Educational Research Open*, 3, 100176. <https://doi.org/10.1016/j.ijedro.2022.100176>

United Nations. (2025). *Sustainable Development Goal 4: Ensure inclusive and equitable quality education and promote lifelong learning opportunities for all*. <https://sdgs.un.org/goals/goal4>

Wang, M. T., & Eccles, J. S. (2020). School engagement: Effects on academic and social-emotional outcomes. *Developmental Psychology*, 56(4), 1–15. <https://doi.org/10.1037/dev0000895>

Zimmerman, B. J., & Kitsantas, A. (2021). Self-regulated learning and academic achievement. *Educational Psychologist*, 56(1), 1–14. <https://doi.org/10.1080/00461520.2020.1851820>