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Investigating Grit and Mindfulness in Teaching as Predictors of Teaching Effectiveness of Math Pre-Service Teachers

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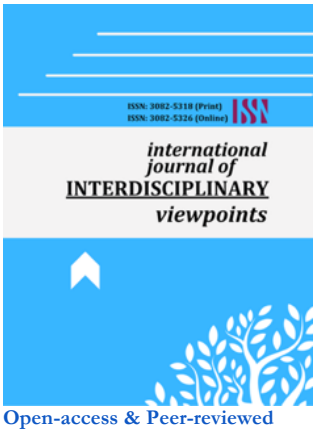

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ABSTRACT

Non-cognitive traits like grit and mindfulness are increasingly recognized as important for effective teaching, especially among future teachers who are still learning to navigate the challenges of classroom practice. This study looked at how well grit and awareness in teaching can predict how well math teachers-to-be at a state college in Davao de Oro, Philippines, will do in their jobs. A descriptive–correlational study design was used with 73 fourth-year pre-service teachers majoring in mathematics and pursuing a Bachelor of Secondary Education. A complete listing chose them. Adapted and tested instruments were used to collect data on grit in teaching, mindfulness in teaching, and teaching success. We used descriptive statistics, Pearson product–moment correlation, and multiple regression models to look at the data. The respondents demonstrated a great deal of grit and mindfulness in their teaching, as well as a very high level of success as teachers. There were strong, positive links found between grit and how well you teach, and between being aware while teaching and how well you teach. More research showed that persistence in teaching and interpersonal awareness were strong predictors of how well teachers would do their jobs, together explaining 57.8% of the variation. These results back theories that say persistence, self-control, and social interaction are important factors in how well a teacher does their job. The study concludes that math teachers-to-be who work on their grit and awareness may be better at their jobs. It suggests that schools that train teachers include grit- and mindfulness-based activities in their classes to help future teachers grow professionally in all areas.

Keywords
grit in teaching; mindfulness in teaching; teaching effectiveness; mathematics pre-service teachers; non-cognitive skills

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INTRODUCTION

Many people agree that how well math is taught is a key factor in determining the level of education and how well students learn. For math teachers to be effective, they need to know a lot about the subject and also know how to run classes, keep students motivated, and build good relationships with them (Burroughs et al., 2019). Demands like these are especially hard for future math teachers because they are going from being math students to new math teachers, which often shows gaps between subject knowledge and teaching practice (Segarra & Julià, 2021; Alrwaished, 2024). Recent studies in education have shown that non-cognitive skills are increasingly important in determining how well teachers do their jobs. Traditional teacher education programs focus on teaching methods and pedagogical knowledge. However, there is growing evidence that psychological traits such as grit and mindfulness are important for teachers' professional functioning and classroom performance (Birchinall et al., 2019; Barber, 2022). Teachers with these non-cognitive traits are better able to handle stress, keep going when things get hard, and keep their emotions in check in difficult classrooms.

Grit, which is defined as sticking with long-term goals and being passionate about them, shows how hard someone works and how committed they are, even when things get hard (Duckworth et al., 2009). When it comes to teaching, grit shows up as sticking to lesson plans, being consistent in your teaching, and committing to long-term professional growth. Empirical studies have demonstrated that teachers with higher levels of grit show stronger self-efficacy, lower burnout, and greater instructional effectiveness (Baraquia, 2020; Sadoughi et al., 2024). These results show that grit is a source of motivation that helps teachers keep up high levels of performance over time. Being mindful, on the other hand, means being aware of the present moment with openness, attention, and no judgment (Frank et al., 2015). Mindfulness can help teachers control their emotions, do more reflective work, and be more aware of what their kids need. Mindful teachers are better at controlling classroom behavior, addressing student problems productively, and maintaining strong relationships with other teachers (Hirshberg et al., 2019; Schussler, 2020). Togol (2024) also found that pre-service teachers who practice mindfulness have less anxiety about teaching and more trust in their ability to teach.

More and more international studies show that grit and focus are strong indicators of how well teachers will do in their jobs. Studies with teachers and those seeking to become teachers have shown that perseverance, resilience, and mindful awareness are associated with better teaching and reduced mental exhaustion (Birchinall et al., 2019; Sadoughi et al., 2024). However, much of this study has been conducted in Western or non-mathematics settings, which means it can't really help people who will be math teachers in developing countries. Studies conducted in the Philippines have found a link between grit and teachers' self-efficacy, professional motivation, and perform (Fabelico & Afalla, 2020; Baraquia, 2020). Tonggol (2024) also says that mindfulness is linked to emotional intelligence and how well pre-service teachers can connect with students in the classroom. Even with these results, there is not much empirical research on how grit and mindfulness affect the teaching effectiveness of future math teachers, especially in provincial and state college settings like Davao de Oro.

State schools are very important for training future math teachers who will have to work with a wide range of students and limited resources. To improve teacher education programs and make sure that all teachers are well-prepared, it is important to know how non-cognitive traits like grit and awareness affect how well teachers do their jobs. This study fills in the blanks by examining the connections among grit, classroom attention, and how well math pre-service teachers in Davao de Oro teach. It does this by drawing on Social Cognitive Theory, Self-Determination Theory, and Expectancy–Value Theory. Its specific goals are to determine the amounts of grit and mindfulness, how well teachers do their jobs, and the connections between these factors, as well as which areas of grit and mindfulness are most useful for predicting how well teachers do their jobs.

MATERIALS AND METHODS

Research Design

This study employed a descriptive–correlational research design to examine the relationships among grit, mindfulness in teaching, and teaching effectiveness of mathematics pre-service teachers. A correlational approach is appropriate when the objective is to determine the degree and direction of association between variables without manipulating them (Singh & Masuku, 2014; Devi et al., 2023). This design allowed the study to determine whether grit and mindfulness are significantly related to teaching effectiveness and which specific domains of these non-cognitive attributes predict it.

Participants

The participants of the study were seventy-three (73) fourth-year BSED Mathematics major pre-service teachers enrolled during the Academic Year 2024–2025. These participants were selected because they had already undergone teaching-related coursework and field-based experiences, making them suitable respondents for assessing teaching effectiveness. The study utilized complete enumeration as the sampling technique due to the manageable size of the population. Complete enumeration ensures that all eligible members of the population are included, thereby eliminating sampling error and increasing the accuracy of the findings (Singh & Masuku, 2014). This approach is appropriate for educational studies involving small, well-defined groups.

Locale

The study was conducted at a state college in Davao de Oro, Philippines, which offers a Bachelor of Secondary Education (BSED) program majoring in Mathematics. The institution is one of the province's primary teacher education providers and plays a crucial role in preparing future secondary school mathematics teachers. The locale was selected for its relevance to teacher preparation in a provincial context and for the accessibility of mathematics pre-service teachers who had completed most of their professional education courses.

Procedures

Before data collection, an outline defense was held, and the panelists and the program head of the teacher education department granted the researchers a certificate of approval. Additionally, the Research Ethics Committee reviewed, approved, and issued the REC clearance form for the research study. A letter of authorization to carry out the study was provided to the researchers once they had obtained the REC clearance. Afterwards, the researcher gathered data on the overall population of fourth-year students enrolled in BSED Mathematics at Davao De Oro State College.

Data collection started after the Research Division and Development approved the request letter for conducting the study. Researchers obtained informed consent after confirming the selected respondents' availability and willingness to participate in the study. The collection process began, and respondents gave their consent to the researcher. The researcher addressed any concerns and issues from the respondents to ensure a smooth data collection procedure.

Moreover, questionnaires were distributed to the fourth-year BSED Mathematics students at each branch of Davao de Oro State College. The respondents' personal information was kept confidential and used only to obtain data necessary for the study. Survey respondents were given adequate time to answer all the questions. Results were then compiled and analyzed from the completed surveys.

Instrument

Three instruments, each adapted and validated, were used to collect data for the study.

The Teacher Grit Scale was used to measure grit in teaching. This instrument assessed two domains: perseverance in teaching and passion and purpose in teaching, reflecting sustained effort and long-term commitment to the teaching profession (Duckworth et al., 2009; Baraquia, 2020).

The Mindfulness in Teaching Scale measured mindfulness in teaching across two domains: intrapersonal mindfulness, which refers to awareness of one's internal states during teaching, and interpersonal mindfulness, which refers to awareness and responsiveness to students during classroom interactions (Frank et al., 2015; Hirshberg et al., 2019).

The School Teacher Effectiveness Questionnaire was used to measure teaching effectiveness in preparation and teaching planning, classroom management, subject-matter knowledge, teaching characteristics, and interpersonal relations. This instrument has been used in previous studies to assess multiple dimensions of effective teaching practice (Dar & Ponraj, 2021).

All instruments underwent expert validation to ensure content relevance and clarity. Pilot testing was conducted prior to the main data collection, and the instruments demonstrated acceptable reliability coefficients, indicating consistent measurement of the intended constructs.

Data Collection

Prior to data collection, approval was secured from the appropriate institutional authorities and the Research Ethics Committee. Participants were informed of the study's purpose, and informed consent was obtained before administering the questionnaires. Participation was voluntary, and respondents were assured that their responses would be used solely for academic purposes.

The instruments were administered during scheduled sessions, and participants were given sufficient time to complete the questionnaires. The researchers were present during data collection to address any clarifications and ensure proper administration of the instruments. Completed questionnaires were retrieved, checked for completeness, and prepared for data analysis.

Data Analysis

Data were analyzed using both descriptive and inferential statistical techniques. Descriptive statistics, including mean and standard deviation, were used to determine the levels of grit, mindfulness in teaching, and teaching effectiveness. Pearson product–moment correlation was employed to examine the relationships between grit and teaching effectiveness and between mindfulness and teaching effectiveness. Multiple regression analysis was used to identify which domains of grit and mindfulness significantly predict teaching effectiveness. Statistical decisions were based on a 0.05 level of significance.

Ethical Considerations

Ethical standards were strictly observed throughout the study. The confidentiality and anonymity of participants were ensured by excluding personal identifiers from the dataset. The study complied with the Data Privacy Act of 2012 (Republic Act No. 10173), and all collected data were securely stored and accessed only by the researchers. Participants were informed of their right to withdraw from the study at any time without penalty.

RESULTS AND DISCUSSION

Level of Grit in Teaching

Table 1 presents pre-service teachers' grit in teaching in two key indicators: Perseverance in Teaching and Passion and Purpose in Teaching. Each indicator is assessed based on mean scores and standard deviations (SD), providing interpretation into the central tendency and variability of pre-service teacher attitudes in these domains.

Table 1. Level of Grit in Teaching

Indicators	Mean	SD	Descriptive Level
Perseverance in Teaching	4.38	0.467	Very High
Passion and Purpose in Teaching	3.92	0.728	High
Overall	4.15	0.505	High

As shown in Table 1, perseverance in teaching is generally very high and passion and purpose are shown to have lower mean score than perseverance in teaching. In general, the average score of 4.15 indicates that pre-service teachers possess high levels of perseverance and passion in teaching, emphasizing these factors' crucial role in developing practical skills in teaching. Additionally, standard deviations (0.467 and 0.728) and means for variables and indicators at around 3.92 to 4.38 suggest that pre-service teachers are consistently high across all indicators. Pre-service mathematics teachers have relatively similar responses toward their grit in teaching, characterized by their deep perseverance and passion for achieving long-term goals.

The findings only prove the importance and crucial role of the persistence of pre-service teachers as they enter the profession. Several studies have supported the significant level of teaching persistence. A study by Zhang et al. (2023) highlights that persistence and engagement trigger positive emotions that broaden thought-action repertoire and build personal resources over time. Moreover, gritty teachers demonstrate unique approaches to classroom implementation. Such teachers are more enthusiastic about collaborating with fellow teachers, asserting professional dialogue, and using peer coaching and supervision as techniques for professional development (Cariaga, 2025; Rachmahana et al., 2024).

Level of Mindfulness in Teaching

Table 2 presents pre-service teachers' mindfulness in teaching in two key indicators: Intrapersonal Mindfulness and Interpersonal Mindfulness. Each indicator is assessed based on mean scores and standard deviations (SD), providing interpretation into the central tendency and variability of pre-service teacher attitudes in these areas.

Table 2. Level of Mindfulness in Teaching

Indicators	Mean	SD	Descriptive Level
Pre-Service Teacher Intrapersonal Mindfulness	3.24	0.894	Moderate
Pre-Service Teacher Interpersonal Mindfulness	3.94	0.758	High
Overall	3.59	0.524	High

As shown in Table 2, intrapersonal mindfulness shows a moderate relationship level with teaching effectiveness, with a mean score of 3.24, which is relatively lower than interpersonal mindfulness, with a mean score of 3.94. In terms of the SD of each domain, pre-service teachers' intrapersonal mindfulness has 0.894 and the respondents' interpersonal mindfulness with 0.758 which are reliable rate. While intrapersonal mindfulness has lower significance, with questions mean score (ranging from 2.77 to 3.75) having less clustered responses compared to the interpersonal mean score (ranging from 3.71 to 4.08).

Thus, indicating that mathematics pre-service teachers exhibit a moderate level of intrapersonal mindfulness, characterized by a mean score of 3.24. Relevant studies have similar results with the intrapersonal level, such as a cross-sectional study of Tao (2022) found that teacher mindfulness has a moderate level of mindfulness in teaching, with a mean score of 3.5469 (SD = 0.4563). Also, two studies with similar results developed and validated the mindfulness in teaching scale in America and South Korea since the 14 items got average scores between 3.30 and 4.19 in Frank et al. (2016) and average scores between 3.40 and 4.24 in Kim and Singh (2018). Moreover, better emotional regulation is linked with mindfulness. Teachers with higher intrapersonal mindfulness tend to have improved emotional resilience and well-being (Cariaga et al., 2025; Zahirinia et al., 2025).

Level of Teaching Effectiveness

Table 3 presents the level of pre-service teachers' teaching effectiveness across five key indicators: Preparation and Teaching Planning, Classroom Management, Knowledge of the Subject Matter, Teaching Characteristics, and Interpersonal Relations. Each indicator is assessed based on mean scores and standard deviations (SD), providing interpretation into the central tendency and variability of pre-service teacher attitudes in these areas.

Table 3. Level of Teaching Effectiveness

Indicators	Mean	SD	Descriptive Level
Preparation and Teaching Planning	4.33	0.482	Very High
Classroom Management	4.39	0.448	Very High
Knowledge of the Subject Matter	4.30	0.472	Very High
Teaching Characteristics	4.23	0.474	Very High
Interpersonal Relations	4.27	0.532	Very High
Overall	4.30	0.419	Very High

As shown in Table 3 the level of teaching effectiveness has an overall description of a Very High level, with a mean score of 4.30. Regarding the Standard Deviation, pre-service teachers have a general score of 0.418 across the different indicators, a reliable rate that signifies their teaching effectiveness is relatively high. Thus, the respondent's mathematics pre-service teacher assesses their skills as having a practical approach to teaching mathematics holistically.

In terms of Preparation and Teaching Planning, a study indicates that planning skills and the ability to create instructional materials are evident across surveyed teachers (Emidar & Indriyani, 2023). This implies the necessity for teachers to develop skills in planning learning before implementing it in class. Moreover, a high level of preparation is important for Pre-service teachers' performance in the classroom (Aripal & Cubero, 2025; Baynosa & Simpal, 2025; Brown et al., 2019). A study by Kochoska and Dance (2020) obtained findings on the significant level of teaching effectiveness across two out of five indicators: Classroom Management and Knowledge of the Subject Matter.

Notably, the results of teacher characteristics, such as their self-efficacy and views on using ICT for teaching purposes, were important elements in explaining the variation in all three outcomes: motivation, expertise, and collaboration (Konstantinidou & Scherer, 2021). Interpersonal relations between teachers highlight their impact on behaviour that makes learners feel supported and cared for (Zheng, 2022), suggesting that high-quality educator-learner relationships offer a support base for long-term learners' education. The results mirror the observation that pre-service teachers have significant interactions with their students, which helps them develop confidence in their practical approach to teaching mathematics.

Additionally, it further showcases how the respondents greatly reflect the high level of teaching effectiveness across the five domains. These results in teaching effectiveness only prove how the college has continually showcased great competence in producing quality and competent students in the Teacher Education Program, specifically, the mathematics major students. indicating readiness for deployment as teaching interns and novice teachers.

Relationship between the Study Variables

Table 4 presents a comprehensive exploration of the factors influencing mathematics pre-service teachers' teaching effectiveness: grit and mindfulness in teaching. Each variable is assessed through p-value and Correlation coefficients (r), underscoring their pivotal roles in predicting teaching effectiveness. With both correlations being highly significant ($p < 0.001$), the table presents higher grit and mindfulness in teaching corresponding to increased teaching effectiveness among pre-service teachers.

Table 4. Relationship between the Study Variables

IV	DV	r	p-value	Decision
Grit	Effectiveness	0.627	0.001	Reject H_0
Mindfulness		0.313	0.008	Reject H_0

The strong linkages and interconnectedness of the study variables are demonstrated by the considerable correlations ($r = 0.627$ to 0.313, all $p < 0.001$) within the dataset. Based on the results, the correlation coefficients (r) between grit and teaching effectiveness, as well as mindfulness and teaching effectiveness, show a significant positive relationship. Therefore, the results show significant positive correlations between grit and mindfulness in terms of teaching effectiveness.

Similarly, the results align with several educational theories, particularly Social Cognitive Theory (SCT), proposed by Albert Bandura; Self-Determination Theory (SDT), developed by psychologists Edward L. Deci and Richard M. Ryan; and Expectancy-value Theory, as proposed by Jacquelynne Eccles and her colleagues. Furthermore, the results align with SCT's emphasis on self-efficacy and self-regulation as key performance drivers. Self-efficacy- the belief in one's ability to execute tasks- shapes goal setting, effort persistence, and resilience (Miras, 2019). Pre-service teachers' grit (perseverance and passion) reflects self-regulated behaviour, where individuals sustain effort toward long-term goals despite challenges. Mindfulness enhances self-observation, a crucial component of SCT. By fostering non-judgmental awareness of classroom dynamics, mindfulness helps teachers adapt strategies in real-time, aligning with SCT's emphasis on environmental and behavioral reciprocity.

Moreover, in Self-Determination Theory (SDT), the focus on psychological need satisfaction (autonomy, competence, and relatedness) provides a lens to interpret how grit and mindfulness enhance teaching effectiveness. Results show that mindfulness develops consciousness in the classroom, which SDT links to autonomous motivation and emotional regulation (Schultz & Ryan, 2015). Mindfulness cultivates present-moment awareness, enabling teachers to act congruently with their values, as it aligns with SDT's claim that autonomy-supportive environments enhance intrinsic motivation, a predictor of teaching quality.Expectancy-Value Theory (EVT), on the other hand, explains how pre-service teachers' expectations of success and perceived value of teaching drive their grit and mindfulness. The result shows that gritty teachers view teaching as valuable and meaningful, which aligns with EVT's task-value construct, while mindfulness enhances the intrinsic rewards of teaching. High grit scores reflect a substantial expectation of success and a high value placed on tasks (Ondap & Simpal, 2025; Cariaga & Gerodias, 2025; Tang & Zhu, 2024). Thus, results showed that grit and mindfulness in teaching have a positive influence on teaching effectiveness. Grit and life satisfaction significantly predicted teacher effectiveness as measured by student academic performance (Christopoulou et al., 2018). The finding suggests that teachers demonstrating greater perseverance and passion for long-term goals may facilitate better student learning outcomes. At the same time, the study by De Carvalho et al. (2021), which conducted a mindfulness-based intervention for elementary school teachers, found significant improvements in mindfulness and emotional regulation competencies, greater self-efficacy, enhanced well-being, and decreased burnout symptoms compared to the control group. These improvements in teacher well-being and psychological resources likely contribute to a more positive and effective teaching presence.

Key Domains of Grit and Mindfulness in Teaching Predicting Teaching Effectiveness

Tables 5 provide a detailed analysis of how specific domains of grit and mindfulness in teaching contribute to predicting teaching effectiveness, as indicated by regression coefficients and significance levels. Table 5 focuses on two key domains; Grit in Teaching: Perseverance in Teaching and mindfulness in teaching: Interpersonal Mindfulness. Each domain is evaluated through unstandardized and standardized coefficients and statistical significance (t and p-values), highlighting its predictive power on teaching effectiveness.

Table 6. Regression Analysis of Teaching Effectiveness

Variable	Unstandardized Coefficients		Standardized Coefficients	t	p
	B	SE	Beta (β)		
Perseverance in Teaching	.592	.073	.662	8.064	<.001
Interpersonal Mindfulness	.120	.045	.217	2.646	.010

Note. Constant =1.231, $F(2,70) = 48.022$, $p<.001$, $R^2=.578$

Table 5 shows the results of the regression analysis on what predicts mathematical satisfaction. The model was statistically significant, $F(2, 70) = 48.022$, $p < .001$, with an R^2 of .578. This means perseverance in teaching and interpersonal mindfulness together explain 57.8% of the variation in pre-service teachers' teaching effectiveness. This is a significant share, indicating that these non-cognitive factors play a crucial role in teaching effectiveness. Focusing on individual domains, the coefficient (B) for perseverance in teaching (PT) is 0.592, with a standard error (SE) of 0.073. Its standardized beta coefficient is 0.662, and it has a t-value of 8.064 with a p-value of < 0.001, which indicates that perseverance in teaching significantly predicts teaching effectiveness. While the coefficient (B) for interpersonal mindfulness (IT) is 0.120, with a standard error (SE) of 0.045. Its standardized beta coefficient is 0.217, and it has a t-value of 2.646 with a p-value of 0.01, indicating that interpersonal mindfulness significantly predicts teaching effectiveness. These results suggest that the model is significant.

Consequently, since the model is significant and it explains 57.8% to variability was explained by the two domains: perseverance in teaching and interpersonal mindfulness. However, the remaining percentage are variables that are not investigated by the study. Hence, we can create our regression equation model which is: $y=1.231+0.592x_1+0.12x_2$, Where x_1= PT and x_2= IM. Based on the regression equation, every unit increase of PT corresponds to 0.592 unit increase in TE. The study's results are presented and discussed in this section. The results come from thematic analysis of in-depth interviews with vegetable growers in Kibenton, Impasug-ong, Bukidnon. The study's goals guided how the talk was set up: (1) The economic problems vegetable farmers faced during the COVID-19 pandemic, specifically with production, distribution, and marketing; and (2) The ways they dealt with their stress, which can be broken down into two groups: problem-focused and emotion-focused coping. The results are analyzed by comparing them with other research to place the subjects' experiences in the broader context of theory and practice.

How Hard Are Pre-service Teachers Willing to Work to Teach Math

The results showed that math teachers-to-be had a lot of grit in the classroom. Perseverance in the classroom got a higher mean score than heart and purpose in the classroom. This shows that the people who answered were usually persistent and willing to keep working at tasks related to teaching, even when they were hard. The importance of determination suggests that future math teachers can handle common problems in the subject, such as preparing lessons and dealing with diverse students. These results align with other research: perseverance is an important part of grit that helps students stay engaged and resilient in school (Duckworth et al., 2009; Baraquia, 2020). High levels of persistence among future teachers-to-be in the Philippines have been linked to greater commitment to teaching and trust in the classroom (Fabelico & Afalla, 2020). From the data, math teachers-to-be are building up the motivation they will need to handle the demands of their job.

Level of Being Mindful While Teaching

It was also found that math teachers-to-be showed a high level of mindfulness while teaching, with interpersonal mindfulness scoring higher than intrapersonal mindfulness. This means that responders paid more attention to and responded to how they interacted with students than to their own feelings and thoughts while teaching. A high level of interpersonal attention means you are aware of your students' needs, how the classroom works, and their emotional cues. All of these things are necessary for good teaching. This finding backs up earlier research that stressed the importance of mindfulness in improving ties between teachers and students and classroom management (Frank et al., 2015; Hirshberg et al., 2019). The relatively lower intrapersonal mindfulness, on the other hand, suggests that future teachers-to-be may need more support in becoming more self-aware and in controlling their emotions when teaching. Tongol (2024) said that pre-service teachers who learn mindfulness can become more emotionally aware and feel less anxious about teaching. This shows that this could be an area that needs help. In all five areas of the study, mathematics pre-service teachers showed a very high level of teaching effectiveness: preparation and lesson planning, classroom management, subject knowledge, teaching traits, and relationships with other students. These results show that respondents thought they were very good at important teaching tasks, indicating that their teacher education training was effective.The very high scores on classroom management and subject knowledge tests show that future math teachers are ready to teach in elementary and middle school settings. These results align with studies showing that successful teacher preparation programs make pre-service teachers feel very confident in what they do (Dar & Ponraj, 2021). However, these results should not be taken too literally, as self-reported measures may reflect how effective teachers think they are rather than how effective they really are.

Connection Between Grit and How Well You Teach

A significant positive relationship was found between grit and how well you teach. This means that higher levels of grit are linked to greater teaching effectiveness. This finding says that math pre-service teachers who show more persistence and a desire to teach do better on tasks that require them to teach. This finding supports earlier studies that found a link between grit and teacher performance, resilience, and self-efficacy (Baraquia, 2020; Fabelico & Afalla, 2020). Grit helps teachers keep going when things get tough in the classroom, stay motivated, and continue improving their teaching. Theoretically, this result aligns with Social Cognitive Theory, which emphasizes the role of self-regulation and determination in how well people perform do work.

Mindfulness and the Effectiveness of Teaching: A Link

The results also showed a strong link between classroom focus and how well teachers do their jobs. This means that math teacher candidates who are more aware tend to be better at teaching math. Mindfulness helps teachers stay alert, emotionally stable, and able to respond to classroom events. This improves the quality of teaching and classroom interactions. This finding aligns with other studies showing that mindfulness helps teachers and students get along better, manage their emotions, and run their classes well (Frank et al., 2015; Hirshberg et al., 2019). Mindful teachers are better able to manage stress and solve classroom problems constructively. This is especially important for teachers-to-be who are just starting in the field.

Predictors of How Well Teachers Do Their Jobs

Multiple regression analysis showed that both persistence in teaching and interpersonal attention were strong predictors of how well teachers did their jobs, explaining 57.8% of the variation. This shows that sustained effort in teaching and thoughtful involvement with students are important factors that affect how well pre-service mathematics teachers teach. Long-term commitment and consistent effort are necessary for successful teaching, as shown by the predictive role of perseverance (Duckworth et al., 2009). Also, the value of interpersonal mindfulness underscores the importance of teachers having good relationships with their students and teaching in ways that meet their needs. These results are in line with two theories: Self-Determination Theory, which says that relatedness and skill are important for driving good behavior, and Expectancy–Value Theory, which says that working hard toward important goals over time is important (Eccles et al., 1983). Overall, the data show that grit and mindfulness work hand in hand to affect how well teachers do their jobs. While grit gives you the drive to keep going, mindfulness makes it easier for people to interact with each other in the classroom. Together, these non-cognitive skills make a big difference in how well math pre-service teachers can do their jobs.

Conclusion and Recommendations

This study looked at how grit and awareness in teaching can be used to predict how well math teachers-to-be at a state college in Davao de Oro will do in their jobs. The results showed that the responders demonstrated a lot of grit and mindfulness in their teaching and were also very good at what they did. When it came to grit, persistence in teaching stood out as the most important trait. On the other hand, interpersonal awareness was more important than intrapersonal mindfulness. These results suggest that math teachers-to-be have the drive and social skills to teach effectively. The study also found strong, positive links between grit and how well you teach and between being aware while teaching and how well you teach. A regression study showed that both persistence in teaching and interpersonal mindfulness were strong predictors of how well someone would teach, accounting for a large portion of the variation. These results support ideas from the Social Cognitive Theory, the Self-Determination Theory, and the Expectancy–Value Theory, which hold that sustained effort, self-regulation,

and meaningful interpersonal engagement are important for success. For the most part, the results show how important non-cognitive skills are for making teaching more successful and how grit and mindfulness work together to help math teachers-to-be grow as professionals.

Based on the study's findings, several suggestions are made. First, institutions that train teachers should include techniques that build grit and mindfulness on purpose in their math education programs. This could include activities such as goal-setting, reflective teaching, mentorship, and mindfulness-based practices that help pre-service teachers be more persistent, manage their emotions, and be more aware of how they interact with others. Second, teachers and teacher educators are told to show students how to be persistent and use mindful teaching techniques when they teach. This way, students can learn these non-cognitive skills by doing them. Pre-service teachers may be better able to use grit and mindfulness in real classrooms if they have structured chances for guided thought and classroom simulations. Third, to help future teachers better manage stress related to school and their jobs, institutional support systems such as counseling services, peer-support programs, and professional development workshops should be strengthened. Finally, it is suggested that longitudinal and mixed-method designs be used in future studies to examine how grit and mindfulness change over time and how these traits affect teachers' success in the classroom during in-service. It may also be possible to get a better picture of how effective teaching is by including more subjects and educational settings in the study.

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Conflicting Interest

The authors declared no conflict of interest in the preparation and publication of this research.

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Contribution

The authors contributed to the overall conduct and writing of the study.

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