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Moderating Effect of Resiliency on the Relationship Between Quality of Teaching and Problem-Solving Skills

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ABSTRACT

This study explores the relationship between teaching quality and students' problem-solving skills, particularly whether resiliency moderates this association. Data from 379 students were gathered using validated tools assessing teaching quality, problem-solving abilities, and resiliency under a quantitative research design. Statistical tools were used to examine the data, including correlation analysis, Spearman-rho, and regression analysis. Results showed a weak but important positive link between teaching quality and problem-solving skills, suggesting that although good teaching improves problem-solving skills, other influencing factors could also be involved. Regression analysis demonstrated that resiliency does not change this correlation, implying that while resilience is a necessary quality, it does not change the effect of teaching quality on students' problem-solving abilities. These results highlight the need to improve teaching methods in light of other important factors that could support students' cognitive growth. Future studies should investigate more factors influencing problem-solving ability to grasp this intricate interaction better.

INTRODUCTION

Students ability to apply their mathematical knowledge in different scenarios has been a concerned in Mathematics education (Ukobizaba *et al.*, 2021). Students deal with various issues in their personal space in addition to the numerous social contexts they are in. Students must use problem-solving abilities to address these problems (Doorman *et al.*, 2020). Additionally, the Program for International Student Assessment (PISA) revealed that almost none of the Philippine students performed well in mathematics, as shown by their inability to achieve Level 5 or 6 on the PISA mathematics exam (OECD, 2023). One study found that college students specifically struggle to comprehend the wording of questions, which aligns with these PISA results (Gonzaga *et al.*, 2026). Even though the main goal of mathematics education is to help students become more adept at solving problems and thinking critically, the results frequently fall short of expectations (Ahdhianto *et al.*, 2020).

To succeed in academic and real-world contexts, students in today's classrooms must learn how to solve mathematical problems. These skills are viewed as critical for learners in the twenty-first century and help students overcome challenging challenges and adapt to changing conditions (OECD, 2023). Research indicates that the contextual issue presentation syntax in problem-based learning helps students train their Problem-Solving Skills (PSS) as efficiently as possible by enabling them to see problems from a real-world perspective (Hudha *et al.*, 2023). Furthermore, as a result of the learning that is shaped by their knowledge and interests in coming up with solutions to the problems they face, people form attitudes toward circumstances, people, or objects (Ocak *et al.*, 2021). Additionally, problem-solving skills are practical skills needed for students to work with others in order to find, assess, integrate, and apply knowledge to novel situations (Ahdhianto *et al.*, 2020).

Constructivist learning theory emphasizes that good instruction is crucial to improving math learners' cognitive abilities (Vygotsky, 1978). Based on this theory, Vygotsky's Zone of Proximal Development (ZPD) emphasizes effective teaching through scaffolding, whereby instructors guide learners toward achieving cognitive tasks beyond their own, thereby maximizing cognitive development. A related theory suggests that effective teaching strategies actively involve students in their learning processes (Hattie, 2009). Problem-based teaching and learning refers to the activity in which students solve practical and cognitive problems by activating their creativity and mental activity and stimulating active involvement in the learning process (Holubnycha *et al.*, 2024). To increase teacher quality, extensive changes have been made to initial teacher education (ITE), despite the lack of data to substantiate that novice instructors are less capable than seasoned ones (Graham *et al.*, 2020).

Furthermore, quality teaching uses appropriate and effective instructional strategies with full knowledge of the content matter, keeping an adaptable approach to engage, challenge, and sustain learning to enhance critical thinking and positive outcomes in well-managed, supportive classrooms. Frequent and meaningful interactions between faculty and students increase student engagement, motivation, and academic success. Given that interactions with students are the most direct and proximal indicator of teachers' influence on students, examining teachers' actual classroom interactions could be helpful in attempts to understand the links between experience and performance. Additionally, observations

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of these interactions are an important indicator of teaching quality (Graham *et al.*, 2020). Additionally, faculty who demonstrate a passion for teaching and are interested in student success tend to create a more supportive and motivating learning environment; effective and timely feedback is crucial for student learning. Studies revealed that teachers are advised to incorporate relevance into their teaching by emphasizing the practical application of the material. They should also be mindful of students' negative emotions and encourage class participation by engaging students about their interests (Ruiz-Alfonso *et al.*, 2020). Finally, the faculty's ability to communicate course information clearly and effectively, their lesson preparation, and the course structure's organization comprises aligning course objectives, assessments, and learning activities to ensure a unified learning experience. The teaching and learning process is the knowledge transition from teachers to learners. It is defined integrating various factors in the process by which an educator identifies and establishes learning objectives, develops teaching resources, and implements the teaching and learning approach (Munna & Kalam, 2021).

Problem-solving skills enable identification of problems, evaluation of information, formulation and then evaluation of solutions, and the enactment of appropriate strategies to overcome all forms of problems by allowing an individual to improve in enhancing critical thinking and adaptability. Being conscious of and keep track of one's cognitive development is extremely helpful, particularly when students are trying to solve mathematical problems. Without these abilities, a person cannot appropriately plan, organize, and keep track of their learning (William & Maat, 2020). Also, the studies revealed that future studies must add to the literature that focuses on the difficulties students encounter in developing metacognition when working through a mathematical problem (William & Maat, 2020). Additionally, numerous studies have been conducted to enhance mathematics teaching, advance students' higher-level skills, and assess learning since problem solving became a focus of the subject (Olivares *et al.*, 2020). Fixing a problem takes four steps: recognizing the issue, developing a plan of action, carrying it out, and analyzing the outcome. Problem-solving skills is "heuristic" problem-solving, which involves a trial-and-error process and the use of practical norms to arrive at a solution. Additionally, the study revealed that in a rapidly changing, globalized world, problem-solving skills are essential not only for the workplace and daily life but also within educational environments (Banawi, 2024).

Resilience is the ability to respond to adversity, challenge, or stress by adapting to its impact, recovering fairly fast, and even thriving, at least in the psychological and emotional sense, and learning from experience to improve and reach a better state while aiming for greater success or self-improvement over time. Resilience theory highlights that it is not the nature of the adversity we encounter that matters the most, but it is our ability to overcome it effectively. Whenever we experience adversity, setbacks, or frustration, resilience helps us to recover and move on (Moore, 2019). Additionally, students with higher resiliency perceive high-quality teaching as less stressful and more manageable, enhancing their problem-solving abilities (Lazarus & Folkman, 1984; Rutter, 1985; Bandura, 1997). Moreover, related studies disclose that the ability of a person or possibly a dynamic system to positively adjust and adapt to challenges and disruptions that affect their development and functioning is known as resilience (Métais *et al.*, 2022). Resiliency traits and behaviors can be fostered by facilitating suitable learning and teaching interventions (Walsh *et al.*, 2020). Lastly, A child's ability to respond positively to change and obstacles in life can allow for greater mental, social, and academic success. Resilience and well-being are crucial in preventing and lessening the severity of mental health problems (Fenwick-Smith *et al.*, 2018).

Though resilience, quality of teaching, and problem-solving skills have been investigated, they are primarily limited to two-variable correlations (William & Maat, 2020; Moore, 2019). The study investigates how resilience influences the relationship between quality of teaching and the student's problem solving skills. A related study also discussed that their systematic review identified two approaches to conceptualizing mathematical resilience: resilience as the coexistence of disadvantage and high mathematical performance and resilience as part of one's mathematical identity (Walsh, *et al.*, 2020).

A fundamental problem identified by a study is that they do not offer a clear working definition of mathematical resilience (Xenofontos & Mouroutsou, 2022). While contextual factors and school-based resilience programs are vital for creating a safe and supportive environment where students and educators can thrive, individual characteristics may also play a role in resilience (Kangas-Dick & O'Shaughnessy,2020).

The significance of this study lies in its potential to improve educational outcomes by establishing how resilience modifies the relationship between the quality of teaching and the student's problem-solving abilities. By recognizing resilience as an important factor, this study can assist in creating focused interventions and support systems that promote both teacher and student resilience. This, in turn, may lead to improved teaching strategies for the teachers and other learning facilitators and problem-solving skills among students, resulting in a more adaptable and successful learning environment. This study has considerable societal value since it addresses critical issues in education, such as teacher burnout and student stress, ultimately improving the well-being of both educators and students.

To make the study easier to comprehend, the researchers looked for the following: the levels of quality of teaching, the levels of problem-solving skills, and the levels of resiliency of students in Mathematics in the Modern World; the significance of the relationship between quality of teaching and problem-solving skills of Mathematics in the Modern World students; and the moderating

effect of resiliency on the relationship between quality of teaching and problem-solving skills. This study will test the following hypotheses at a .05 significance level. There is no significant relationship between the quality of teaching and problem-solving skills, and resilience has no moderating effect on the relationship between the quality of teaching and problem-solving skills in Mathematics in the Modern World.

MATERIALS AND METHODS

Research Respondents

The study involved students from a tertiary education institution in Davao City enrolled in the 2024-2025 school year. The study's respondents were students enrolled in the course Mathematics in the Modern World. There were 379 students from the population size of 27,501, conforming with the 5% margin of error and 95% confidence level. To meet the reliable parameter estimates, it was recommended to have sample sizes of a minimum of 300 (Moore *et al.*, 2020).

Convenience sampling was used in this research to choose regarding how accessible and willing they were to be included (Nikolopoulou, 2023). Researchers recruited students who were available and willing to engage in the study, for example, those who were accessible in common spaces such as the library, cafeteria, or corridors. The number of samples was established about the overall student population, as presented by the school's Records and Administration Center. Although this approach supported rapid and economical data gathering, it lacks the randomness of probability sampling, through which sampling bias may be engendered and limit the representativeness to the larger group of students (Simply Psychology, 2023).

As part of the inclusion and exclusion criteria, only students who had previously completed the Mathematics in the Modern World course at the designated institution were included in the study. Students who had not enrolled in or completed the course were excluded, as their participation fell beyond the defined scope of this research. Additionally, the respondents' participation relied on their consent form signatures. The respondents had every right to withdraw, refuse, delete, and modify their remarks during the research survey.

Research Instruments

The researchers adapted survey questionnaires to measure the level of students' resiliency, quality of teaching on the said course, and problem-solving skills. The researchers utilized the HEDS Teaching Quality Survey, which followed a five-point Likert-type questionnaire with the following indicators: contact and interactions with faculty (5 items), faculty's interest in teaching and students (5 items), receiving feedback from faculty concerning learning in the classroom (2 items), and faculty skill, clarity, preparation, and organization in teaching (10 items). The researchers used the Nicholson McBride Resilience Questionnaire (NMRQ), a 12-item survey questionnaire, to assess the moderating variable (Lewis, 2018).

Both survey questionnaires consisted of five degrees, each corresponding to a different quality of teaching and resiliency. For instance, a mean score within the range of 4.20 to 5.00, denoted as Very High, implied exceptional and engaging teaching methods, excellent student understanding and satisfaction, and the students were resilient most of the time. Similarly, a mean score between 3.40 and 4.19, labeled as High, indicated effective teaching techniques, strong student comprehension, and positive feedback, andd students being fairly resilient and able to handle most adversities well. A mean score from 2.60 to 3.39, denoted as Moderate, implied adequate teaching quality, students grasping concepts reasonably well, and students being able to cope with challenges but needing support in tougher situations. Furthermore, a mean score of 1.80 to 2.59, described as Low, indicated that teaching methods may have lacked effectiveness, students struggled more with understanding, and students struggled with adversity and required considerable support. Lastly, a mean score between 1.00 and 1.79, labeled as Very Low, implied poor teaching quality, students frequently being confused or dissatisfied, and students being easily overwhelmed by challenges and needing significant assistance. These rating levels served as valuable tools for interpreting and categorizing the diverse degrees of quality of teaching and resiliency, spanning the spectrum from very low to very high.

On the other hand, problem-solving skills were evaluated using modified standardized tests to assess problem-solving abilities and measure the level of problem-solving skills of the students. The test comprised a 30-item questionnaire with 10 items each for the three main indicators of sequence, sets/subsets, and transformation. The questionnaire aimed to assess how well the students understood and applied these ideas. This study asked respondents to solve structured problems on the same modified standardized test, which assessed their general problem-solving abilities. The Classic Exemplars Rubric (Illinois Transitional Math, 2019) was used to analyze the data according to the performance of the students. Students with scores between 24 and 30 were classified as Experts because they showed a thorough comprehension of the material and the capacity to apply it in challenging and novel contexts. Those scoring between 17-23 were classified as Practitioners, indicating a solid grasp of concepts and the capability to solve standard problems, though they may have struggled with more complex ones. Students scoring between 10-16 fell under the Apprentice category, signifying an understanding of basic concepts and the ability to solve straightforward problems with guidance. Lastly, students with scores between 1-9 were labeled as Novices, reflecting a limited understanding of concepts and difficulty in problem-solving.

Design and Procedure

This research study used the descriptive-correlation approach, the most appropriate and suitable method for

this study. The descriptive-correlational research design aimed to illustrate and break down the relationship between two or more variables without mentioning anything related to cause and effect (Bhat, 2023). The researchers' approach aligned with the study as it aimed to test the relationship between students' quality of teaching and problem-solving skills. It also sought to determine the moderating effect of resiliency on the two variables.

The researchers followed a process to obtain the necessary data for the study. First, the researchers submitted a letter to the respective authority asking permission to conduct the study. Once permitted, the researchers asked the respondents to complete an Informed Consent form. Once the informed consent form was completed and signed, the researchers provided details about the study to the respondents through the given informed consent document. The document highlighted the study's purpose, estimated duration, and procedures. Then, the researchers distributed survey questionnaires to the respondents. These survey questionnaires required approximately 25 minutes to complete. The respondents were asked to complete the survey questionnaires. Once data were collected, the researchers provided the collected data to the statistician. The statistician handled the task of verifying and analyzing the given data. Then, the statistician returned the analyzed data to the researchers to complete the interpretation.

The researchers upheld ethical standards throughout the study. Researchers securely stored the collected data in a sealed envelope, restricting access to authorized personnel only. The gathered data were analyzed with statistical tools: mean and standard deviation for the respondents' faculties' quality of teaching and students' problem-solving skills; Spearman-rho for the relationship of the variables; and regression analysis to test whether resiliency moderated the relationship between the two variables.

RESULTS AND DISCUSSION

Quality of Teaching

Table 1 presents students' perceptions of the quality of teaching based on four key aspects: faculty interaction, interest in teaching, feedback provision, and teaching clarity. The overall mean score of 3.98 (SD = 0.50) suggests that students generally perceive their instructors positively. This indicates that faculty members demonstrate strong engagement, enthusiasm for teaching, and the communication ability. Additionally, the high rating implies that students receive timely and constructive feedback, contributing to their learning progress. These results imply that teachers use efficient teaching strategies that improve students' understanding and academic achievement.

Students value how well their teachers explain concepts, as evidenced by the highest rating of faculty skill and clarity (M = 4.15, SD = 0.56) among the four indicators. Such implies that a strong point of the learning environment is well-organized and unambiguous instruction.

Table 1: Level of Students' Perspective on Quality of Teaching

Indicators	Mean	SD
Contact and Interaction with Faculty	3.79	0.62
Interest in teaching and students	4.14	0.62
Receiving Feedback from faculty concerning your learning in the classroom	3.85	0.68
Faculty Skill and Clarity	4.15	0.56
Overall	3.98	0.50

Conversely, faculty contact and interaction received the lowest ratings (M = 3.79, SD = 0.62), which may indicate that students do not feel a strong bond with their teachers. The comparatively low mean score raises the possibility that students are not feeling adequately engaged or supported by their teachers, which may impact their motivation, satisfaction, and overall learning outcomes. Especially in large classes or when staff members are less approachable, a lack of communication or infrequent or ineffective communication, both inside and outside of the classroom, can contribute to feelings of alienation or detachment.

According to Loes, Saichaie, Padgett, and Pascarella (2012), students' perceptions of teaching quality are significantly associated with important academic outcomes such as critical thinking, engagement, and lifelong learning. The high level of students' perception of teaching quality was indicated by the mean score of 3.98 on the HEDS Teaching Quality Survey, which aligns with these findings. That implies that students believe their teachers use effective teaching strategies, such as organization, clarity, constructive criticism, and meaningful engagement. The reliability of these results is further supported by the HEDS Teaching Quality Survey's strong internal consistency, with Cronbach's alpha ranging from.90 to.96 (Center of Inquiry, 2017). Similarly, a study on teaching performance at Bukidnon State University found that faculty members were rated very satisfactory overall, with assessment of learning scoring highest and innovativeness and creativity scoring lowest (Barcelona & Osias, 2025)

Problem-Solving Skills

This section presents Table 2, which shows the students' levels of problem-solving skills, categorized into three indicators: Set/Subsets, Sequences, and Transformation. The overall mean score of 14.69 suggests that students demonstrate a moderate level of problem-solving

proficiency, placing them within the Practitioner category. It implies that while students have a solid understanding of mathematical concepts and who can solve standard problems, they may struggle with more complex and non-routine mathematical challenges.

Among the indicators, Set/Subsets recorded the highest mean 6.48 (SD = 3.02) which places students within the Practitioner level, suggesting that most students have a solid grasp of categorizing and organizing elements within a problem and are generally capable of solving standard problems in this area. However, they may face challenges with more complex scenarios. Meanwhile, the transformation had the lowest mean of 3.93 (SD = 2.61), falling under the Apprentice category, indicating that students face the most difficulty in restructuring and adapting problems into new forms.

Table 2: Level of Problem-Solving Skills

Indicators	Mean	SD
Set/Subsets	6.48	3.02
Sequences	4.28	2.34
Transformation	3.93	2.61
Overall	14.69	6.53

The above implies that students tend to struggle with being able to reconstrue and transform problems into new or other forms a necessary part of math thinking. The students' difficulty here can be due to a conceptual gap or a thinking flexibility issue since transformation tasks need more than mechanical application of procedures; they call for creativity, abstract thinking, and the capability to connect among different representations of a problem. This thinking skill asks students to reformulate, restate, or convert math problems or representations into alternative forms, typically requiring abstract thought and fluid reasoning.

Based on performance assessments across various grade levels and demographic groups, Amalina and Vidákovich (2023) discovered that students' mathematical problem-solving abilities generally fall within the moderate range. According to their study, students frequently exhibit partial proficiency, meaning they can comprehend problems and use fundamental techniques. However, they struggle to develop comprehensive answers or consistently provide evidence for their arguments. In alignment with these findings, the present study also recorded a moderate level of problem-solving performance among students, meaning that although they can complete mathematical tasks, their proficiency is still in the developing stage rather than at a high or advanced level. It supports the larger pattern in educational research that students typically exhibit intermediate proficiency in problem-solving skills.

Effect of Resiliency

This section presents Table 3, which explores how resilient students are in the face of challenges, based on their responses to the Nicholson Resiliency Questionnaire. The overall mean score of 3.68 falls within the 'high' category, meaning that most students are fairly resilient. It suggests that they are generally overcome obstacles, manage stress, and adapt to difficulties. These results also highlight the positive impact of effective teaching strategies, strong student comprehension, and constructive feedback in fostering resilience.

Looking closer at individual scores, item statement 10 received the highest mean score (3.96), which suggests that students feel most confident in this particular area of resilience, likely linked to emotional regulation and coping skills. However, responses to item statement 7 had the lowest mean score (3.34; SD = 1.04), suggesting that some resilience-related skills might still require work. While many students are resilient, some may struggle more than others, as evidenced by the standard deviations of the scores. It points to a chance for educators and schools to offer more specialized assistance to students

Table 3: Level of Resiliency

Statement	Mean	SD
1.In a difficult spot, I turn at once to what can be done to put things	3.84	0.68
2.I influence where I can, rather than worrying about what I can't influence	3.85	0.69
3.I don't take criticism personally.	3.73	0.96
4.I generally manage to keep things in perspective.	3.93	0.78
5.I am calm in a crisis.	3.64	0.92
6.I'm good at finding solutions to problems.	3.63	0.90
7.I wouldn't describe myself as an anxious person.	3.34	1.04
8.I don't tend to avoid conflict.	3.38	0.98
9.I try to control events rather than being a victim of circumstances.	3.79	0.86
10.I trust my intuition.	3.96	0.95
11.I manage my stress levels well.	3.47	1.05
12.I feel confident and secure in my position	3.62	0.92
Overall	3.68	0.58

who require it.

The present study found that students exhibited a high level of resiliency, as indicated by a mean score of 3.68. Such is consistent with the findings of Pilafas *et al.* (2020), who reported that the Nicholson McBride Resilience Questionnaire (NMRQ) is a reliable tool for assessing individuals' resilience levels (Cronbach's α =.80). Strong personal qualities like flexibility, tenacity, and the capacity to bounce back from stress or hardship are reflected in this score. A mean above the midpoint indicates a well-developed ability to cope and regulate emotions, in accordance with the NMRQ's interpretation guidelines. The findings further validate the NMRQ as a useful indicator of resiliency in educational settings by confirming previous research that suggests students with higher resilience levels can handle both personal and academic challenges better.

Correlation of Quality of Teaching and Problem-Solving Skills

Table 4 presents the correlation matrix between quality of teaching and students' problem-solving skills in Mathematics in the Modern World (MMW). It examines the relationship between various aspects of quality teaching and problem-solving components. The correlation values indicate how strongly these teaching factors influence students' problem-solving abilities, with significance levels denoted by $p < .05$. The overall results suggest that interest in teaching and students ($r = .170$, $p < .01$) has the highest significant correlation, indicating that when teachers are passionate about their work, students develop better problem-solving skills. Additionally, faculty skill and clarity ($r = .123$, $p < .05$) also play a crucial role in enhancing cognitive abilities, emphasizing the importance of clear and structured instruction.

Among the key findings, receiving feedback from faculty shows a strong correlation with Set/Subsets ($r = .50$, $p < .05$), suggesting that feedback helps students in categorizing and breaking down problems. However, the same factor shows a negative or insignificant correlation with other problem-solving components, indicating that feedback alone may not enhance higher-order thinking skills. The lowest correlation appears between receiving

Table 4: Significant Relationship between Quality of Teaching and Students' Problem-Solving Skills in Mathematics in Modern World

Quality of Teaching	Problem-Solving Skills			
	Set/Subset	Sequence/Series	Transformation	Overall
Contact and Interaction with Faculty	.126* (.028)	.063(.269)	.076(.187)	.100 .081)
Interest in teaching and students	.185*(.001)	.092(.109)	.172*(.003)	.170*(.003)
Receiving Feedback from faculty concerning your learning in the classroom	.50*(.381)	-.030(.602)	.012(.830)	.007(.900)
Faculty Skill and Clarity	.176*(.002)	.024(.679)	.113*(.048)	.123*(.031)
Overall	.167*(.004)	.046(.427)	.119*(.038)	.126*(.028)

feedback and Sequence/Series ($r = -0.030$, $p > .05$), implying that structured feedback may not directly contribute to pattern recognition in problem-solving. Another important result is the positive correlation between faculty interest and both Set/Subsets ($r = .185$, $p < .01$) and Transformation ($r = .172$, $p < .01$), reinforcing the idea that engaged teaching promotes adaptability in problem-solving. These findings suggest that faculty engagement and instructional clarity are essential in helping students develop problem-solving skills beyond basic comprehension.

The findings highlight how high-quality instruction, faculty involvement, and instructional clarity impact students' problem-solving abilities. Based on the findings, students are more likely to learn the cognitive abilities required for analysis and problem-solving if given interactive support and guided instruction. Research has shown that interactive, well-crafted learning environments enhance students' understanding of challenging concepts and facilitate deeper learning (Kadi *et al.*, 2021). Active teachers who create a dynamic classroom atmosphere assist students in developing greater flexibility when tackling challenging mathematical ideas. It is consistent with research highlighting how faculty involvement can inspire students and improve their capacity to overcome academic obstacles (Anderson, 2024). Furthermore, regular and meaningful interactions between faculty and students have been demonstrated to improve cognitive development and motivation, improving academic performance and problem-solving abilities (Chhetri & Baniya, 2022). The findings indicate that effective teaching practices are crucial for enhancing students' ability to think critically and apply problem-solving methods. Such bolsters the evidence that fosters problem-solving skills through clear instruction and faculty-student interaction (Montague *et al.*, 2023).

Moderation Analysis on Resiliency, Quality of Teaching, and Problem-Solving Skills

Table 5 presents the regression analysis exploring whether resiliency influences the relationship between quality teaching and problem-solving skills. The results suggest that while quality teaching and resilience contribute to problem-solving, resilience does not significantly alter their connection. The coefficient for quality teaching (1.05) shows a positive effect, but the p-value (.219) indicates it is not statistically significant. Resilience, conversely, has a coefficient of 1.47 with a p-value of .05,

suggesting it is close to being significant. However, the interaction term (-1.996) and its p-value (.109) reveal that resilience does not meaningfully strengthen or weaken the link between teaching quality and problem-solving skills.

Looking deeper into the data, resilience has the highest coefficient (1.47), meaning it plays the strongest role in problem-solving. Although its p-value is close to the significance threshold, it does not provide strong enough evidence to confirm its impact. The interaction term is negative (-1.99), which unexpectedly suggests that resilience might slightly reduce the effect of teaching quality on problem-solving rather than enhance it. Additionally, the R-square value of .0345 and R^2-change of .0083 indicate that the model explains only a small portion of the changes in problem-solving skills. It means other factors, such as motivation or peer influence, may contribute more to students' ability to solve problems effectively.

A supportive learning environment plays a crucial role in shaping students' experiences, which aligns with the idea that quality teaching fosters better learning outcomes (Decristan *et al.*, 2023). Though resilience helps students to overcome challenges (Yıldırım & Arslan, 2020), its influence in this research was not as significant as expected. It raises the question of whether outside help is enough or whether other elements are more crucial in enhancing problem-solving skills. Though it helps students handle stress and uncertainty (Rodríguez-Fernández al., 2021), resilience seems to have little ability to strengthen the link between the quality of teaching and problem-solving skills. This finding concurs with literature indicating that as useful as it is, resilience cannot always act as a potent moderator in education (Fernández-Martínez *et al.*, 2019). It means that the promotion of problem-solving skills may require a more universal approach beyond resilience and quality instruction.

The findings indicate that although resilience and quality instruction play a part in problem-solving, resilience plays no significant role in the connection between the two. Based on current research, a wide range of cognitive, emotional, and contextual factors impact one's ability to problem-solve (Panadero *et al.*, 2019). For better support for students, schools may need to explore other factors such as motivation, self-confidence, and collaboration (Tang *et al.*, 2023). While resilience is still important, it may do more independently than contribute directly to increasing the effectiveness of instruction. Future research could analyze these additional variables to understand better what supports students in establishing strong problem-solving skills.

Table 5: Regression Analysis of the Three Variables for Moderation Test

Tread	Beta	S.E.	t	p
Quality of Teaching	1.05	0.85	1.23	0.22
Resilience	1.47	0.75	1.97	0.05
Interaction	-1.99	1.24	-1.61	0.11
R-Square = .0345 R^2-Change = .0083				

CONCLUSIONS

The study shows that the quality of teaching is important for students to learn how to solve problems. It shows that teachers need to be more involved with their students, give instructions, and provide regular feedback. Students generally like their teachers. There are clear gaps in the way teachers and students interact and support each other. Students are good at figuring out what kind of problem they are dealing with. They have a hard time using the information they have to come up with a solution. Being able to bounce from obstacles helps students solve problems but it does not change the fact that quality teaching is important for problem solving.

There are some limitations to the study like the fact that it only looked at a group of students and relied on what the students said about themselves which might not be entirely accurate. Future studies should look at students from different backgrounds and use more objective ways of measuring problem-solving skills. The study found three things that can be improved: teachers need to be more available, to students and work with them more regularly students need to practice working with real-world problems and collaborating with their peers to get better at using information to solve problems and students need more support to deal with stress and stay mentally healthy like stress management programs and mental health support.

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