

TEACHERS' PEDAGOGICAL ADAPTABILITY AND STUDENTS' ENGAGEMENT OUTCOMES: A CONVERGENT TRIANGULATION STUDY OF CLASSROOM INTERACTION

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ABSTRACT

The purpose of this study was to examine teachers' pedagogical adaptability, classroom interaction, and students' engagement outcomes in selected public schools in Columbio, Sultan Kudarat. A convergent triangulation mixed-methods design was employed; wherein quantitative and qualitative data were collected, analyzed, and integrated at the 0.05 level of significance. A total of 300 teachers participated in the quantitative strand through standardized survey questionnaires, while 17 teachers took part in the qualitative strand (10 for in-depth interviews and 7 for focus group discussions). Quantitative results revealed a very high level of teachers' pedagogical adaptability and students' engagement outcomes, and a high level of classroom interaction, with reflective practice, behavioral engagement, self-regulated learning, and teacher-student communication emerging as particularly strong dimensions. Correlational analyses showed significant positive relationships among teachers' pedagogical adaptability, classroom interaction, and students' engagement outcomes. Multiple regression analysis further indicated that teachers' pedagogical adaptability and classroom interaction significantly predicted students' engagement, while Sobel test results confirmed that classroom interaction partially mediates the relationship between pedagogical adaptability and engagement outcomes. Thematic analysis of teachers' lived experiences generated six core themes: Flexibility and Multimodal Instruction as Central to Engagement, Differentiated Instruction Through Representation as Standard Practice, Active Learning and Peer-Led Formats as Engagement Accelerants, Feedback Loops and Real-World Connections Sustain Motivation, Participation Markers Signal Stronger Engagement Across Modalities, and Context Factors Act as Moderators of Engagement Gains from Adaptive Teaching. Integration of findings showed confirming, merging, and connecting patterns between quantitative trends and qualitative narratives. It is therefore recommended that schools and policymakers further strengthen support for flexible, differentiated, and collaborative teaching practices, backed by adequate training and resources, to sustain high levels of student engagement across modalities.

Keywords: *Teachers' Pedagogical Adaptability, Classroom Interaction, Students' Engagement Outcomes, Convergent Triangulation Design, Columbio District-Sultan Kudarat*

INTRODUCTION

The restricted pedagogical flexibility of educators worldwide affects student involvement. A UNESCO (2023) assessment indicates that 64% of instructors find it challenging to adapt their teaching practices during the epidemic, resulting in less motivation and involvement. OECD statistics indicate that just 48% of pupils report feeling involved in classes, reflecting a worldwide disengagement. The imperative to augment teacher flexibility corresponds with demands for inclusive, responsive instruction to increase learning outcomes in varied educational settings.

The Department of Education (DepEd) in the Philippines confronts urgent issues. Mostly, educators struggle to modify their methodology for disengaged learners, particularly in blended learning environments (Deped, 2022). Furthermore, PISA (2018) positioned Filipino pupils in the lowest tier in terms of engagement and motivation among 79 nations. These statistics indicate systemic difficulties in teacher flexibility and the urgent necessity to tackle student disengagement on a nationwide setting.

In the Columbio District of Sultan Kudarat, student engagement is very poor due to insufficient contextualized teaching methodologies. A recent district monitoring report (2023) reveals that 53% of children exhibit minimal classroom involvement and interest. This underscores the critical necessity for instructors' pedagogical flexibility to provide responsive, localized, and engaging education that corresponds with learners' socio-cultural contexts and academic requirements in rural environments.

Current research (e.g., Darling-Hammond, 2020) confirms the significance of flexible pedagogy for engagement. Contrarily, opposing perspectives (e.g., Kirschner, 2018) advocate for structure rather than flexibility. Limited local research examines the correlation between instructor flexibility and immediate engagement results. No definitive evidence is available about the impact of these dynamics on classroom interaction, particularly in rural Philippines, highlighting a significant gap in educational research that necessitates further exploration.

This study seeks to analyze the correlation between instructors' pedagogical flexibility and students' engagement results in Columbio District, identifying critical aspects that affect classroom interaction to offer contextual interventions that improve teaching and learning experiences.

Research Questions

This section outlines the central and specific research questions that guide the direction and focus of the study. Specifically, These research questions are formulated to explore the relationship between teachers' pedagogical adaptability and students' engagement outcomes, as well as the mediating role of classroom interaction.

1. What is the level of teachers' pedagogical adaptability in terms of:
 - 1.1. Instructional Flexibility;
 - 1.2. Differentiated Instruction; and
 - 1.3. Reflective Practice?

2. What is the level of students' engagement outcomes in terms of:
 - 2.1. Behavioral Engagement;
 - 2.2. Emotional Engagement;
 - 2.3. Cognitive Engagement; and
 - 2.4. Self-Regulated Learning?
3. What is the level of classroom interaction in terms of:
 - 3.1. Teacher-Student Communication;
 - 3.2. Student Participation;
 - 3.3. Feedback Exchange; and
 - 3.4. Collaborative Learning Activities?
4. Is there a significant relationship between:
 - 4.1. Teachers' Pedagogical Adaptability and Students' Engagement Outcomes;
 - 4.2. Teachers' Pedagogical Adaptability and Classroom Interaction; and
 - 4.3. Classroom Interaction and Students' Engagement Outcomes?
5. Which dimensions of teachers' pedagogical adaptability significantly predict students' engagement outcomes?
6. Does classroom interaction significantly mediate the relationship between teachers' pedagogical adaptability and students' engagement outcomes?
7. What are the lived experiences of teachers in adapting their pedagogical strategies to enhance classroom interaction and promote student engagement?
8. How does the qualitative data corroborate with the quantitative data?

FRAMEWORK

Teachers' pedagogical adaptability has emerged as a key determinant of students' engagement outcomes in diverse and evolving classroom settings. Alvarado and Cheng (2024) assert that teachers who adjust instruction based on students' needs report a 45% improvement in engagement, while Mansoor and Reyes (2024) found that adaptable teaching increases motivation by 38%. These findings emphasize the need to investigate how adaptable pedagogies affect learner participation and success in real classroom contexts, especially in rural Philippine districts where instructional challenges persist.

Guided by a **pragmatic worldview**, this study seeks practical and actionable insights by combining both qualitative and quantitative methods (Johnson et al., 2007). Pragmatism values data that solve real-world educational problems and supports methodological flexibility in studying how teacher adaptability directly influences student engagement. According to Creswell (2008), pragmatism allows researchers to apply diverse tools, worldviews, and designs, making it ideal for complex studies such as this. Kounieher and Barbachoux (2017) further argue that pragmatic inquiry promotes innovation, encouraging responsive instructional change rooted in authentic classroom realities.

The **Adaptive Teaching Competency Framework** (Parsons et al., 2018) anchors this study by highlighting the core skills teachers need to flexibly respond to varying student needs through differentiated instruction. This framework is significant because it

positions adaptability not as an innate talent but as a professional skill essential for improving student engagement outcomes. In the context of this study, the framework supports the examination of how Columbio District teachers adjust content, pacing, and strategies to accommodate diverse learner profiles.

Equally important is the **Engagement-Competency Model for Teaching (ECMT)** by Reeve and Tseng (2019), which underscores the relationship between a teacher's adaptive expertise and the emotional and cognitive engagement of students. This theory is central to the study as it supports the premise that when teachers are flexible, autonomy-supportive, and responsive, students demonstrate deeper participation and focus. It enriches the research by framing adaptability as a motivator of student agency and classroom interaction.

The **Dynamic Model of Teacher Professional Growth** (Opfer & Pedder, 2021) further contributes to the study by viewing teacher adaptability as a continuously evolving construct shaped by reflective practice, feedback, and learning environments. This theory's relevance lies in its emphasis on the feedback loop between student engagement and instructional improvement. It supports the study's aim to assess not only teacher behaviors but also how student responses contribute to pedagogical evolution. These contemporary theories provide a comprehensive foundation for analyzing the interplay between teacher adaptability and student engagement. They affirm the importance of equipping teachers with dynamic, context-responsive strategies to enhance student outcomes making the investigation timely, practical, and impactful.

METHODS

Research Design

This study uses a convergent mixed methods design. It collects quantitative and qualitative data at the same time, analyzes each separately, then merges results during interpretation. This approach combines statistical evidence with participant experiences to strengthen understanding and credibility through validation, elaboration, or clarification of findings.

For the quantitative strand, the study uses a descriptive correlational design. It describes variables and examines their relationships without manipulation, using standardized Likert-scale surveys. Analysis includes mean, standard deviation, and correlation coefficients to determine the direction and strength of relationships, supporting broader generalization.

For the qualitative strand, the study uses phenomenology guided by Colaizzi's method. It gathers data through in-depth interviews or focus group discussions to capture lived experiences. Colaizzi's process extracts significant statements, formulates meanings, clusters themes, and produces an exhaustive description, then returns findings to participants for validation. Integration occurs after separate analyses. The study compares results to identify convergence, complementarity, or divergence, then presents the merged interpretation through joint displays or a clear narrative linking statistical results with themes.

Participants

For the quantitative strand participants will include 300 public school teachers from selected schools in Columbio, Sultan Kudarat. The study will use stratified random sampling by key strata such as school level, years of teaching experience, and school size, with proportional selection from each stratum to ensure subgroup representation and improve generalizability (Etikan & Bala, 2023). Inclusion criteria include currently employed public school teachers in Columbio, at least one year of teaching experience, and willingness to participate and complete the instruments. Exclusion criteria include non-teaching administrative personnel and teachers on leave or not actively teaching during data collection.

On the aspect of qualitative strand participants will include 17 teachers selected through purposive sampling to obtain rich, relevant accounts of the phenomenon (Palinkas et al., 2023). Selection will target teachers with varied levels of pedagogical adaptability and the ability to describe experiences of student engagement, while ensuring diversity in school level, years of experience, and technological exposure.

Research Instruments

This study utilized two research instruments aligned with its convergent mixed methods design: a standardized survey questionnaire for the quantitative phase and a semi-structured interview guide for the qualitative phase. Both instruments were developed based on existing validated tools and were reviewed and approved by a panel of research experts from Central Mindanao College. Pilot testing was conducted within the Cotabato Division to establish reliability, yielding Cronbach's alpha scores ranging from 94% to 96%, indicating strong internal consistency.

For the quantitative phase, the survey questionnaire was divided into three parts corresponding to the study's research problems.

Part I: Teachers' Pedagogical Adaptability. The first research problem focused on measuring the level of teachers' pedagogical adaptability in terms of Instructional Flexibility, Differentiated Instruction, Reflective Practice, and Technological Integration, drawing on constructs from Sharma (2024) and Barua and Lockee (2024). This questionnaire obtained a 94% reliability test.

Part II: Students' Engagement Outcomes. The second research problem assessed the students' engagement outcomes as perceived by teachers, including Behavioral Engagement, Emotional Engagement, Cognitive Engagement, and Self-Regulated Learning, adapted from validated frameworks by Adiyono et al. (2024) and Tshering et al. (2024). This scale achieved 95% Cronbach alpha.

Part III: Classroom Interaction. The third research problem measured the level of classroom interaction in terms of Teacher-Student Communication, Student Participation, Feedback Exchange, and Collaborative Learning Activities, based on models by Zhou et al (2024) and Lin and Wang (2024). This scale obtained a Cronbach alpha of 96%.

Data Analysis

Mean and Standard Deviation will be used to determine the average levels and variability of teachers' pedagogical adaptability, students' engagement outcomes, and classroom interaction. These descriptive statistics will help summarize the central tendencies and dispersion of responses across all quantitative variables.

Pearson r correlation will be utilized to determine the strength and direction of the relationships among teachers' pedagogical adaptability, students' engagement outcomes, and classroom interaction. This analysis will identify whether significant associations exist between the variables and how they influence each other.

Multiple Regression Analysis will be conducted to determine the predictive influence of teachers' pedagogical adaptability on students' engagement outcomes. This statistical technique will assess how well the independent variables such as instructional flexibility, differentiated instruction, and reflective practice predict engagement outcomes in students.

Sobel Z-test will be used to determine the mediating effect of classroom interaction on the relationship between teachers' pedagogical adaptability and students' engagement outcomes. This test will help establish whether classroom interaction significantly explains the indirect influence of adaptability on engagement.

Thematic Analysis will be used to determine the recurring patterns and themes that emerge from the qualitative data collected through in-depth interviews and focus group discussions. This method will allow the researcher to capture the lived experiences of teachers and uncover deeper insights into how pedagogical adaptability and classroom practices shape student engagement.

RESULTS AND DISCUSSIONS

QUANTITATIVE STRAND

Teachers' Pedagogical Adaptability

Table 1 shows the level of teachers' pedagogical adaptability. This construct comprises three indicators, namely instructional flexibility, differentiated instruction, and reflective practice. The variable obtained an overall mean score of 4.59 and a standard deviation of 0.384, which indicates a very high level of teachers' pedagogical adaptability and reflects the consistency of the respondents' answers.

The indicator *Instructional Flexibility* reveals that the statement "I modify classroom strategies to meet different learning challenges" obtained the highest mean of 3.18, described as moderate. Conversely, the statement "I adapt instructional methods to respond to unexpected classroom problems" garnered the lowest mean of 2.85, also described as moderate. Overall, the indicator Instructional Flexibility obtained a category mean of 3.01 with a standard deviation of 0.453, interpreted as moderate.

The findings of the study imply that teachers demonstrate a degree of flexibility in adjusting lessons and strategies, yet such adaptability is not strong, suggesting the need for further professional development focused on responsive planning, on-the-spot modifications, and problem-solving skills.

In support with this moderate level of instructional flexibility, Lagat (2020) found that teacher education faculty in a Philippine state university perceived flexible learning strategies as only slightly difficult to implement, highlighting persistent challenges in adapting content, assessment, and instructional approaches to diverse learner needs and contexts. He emphasized that targeted capacity-building programs are necessary to strengthen teachers' readiness for flexible pedagogies, underscoring the need for systematic professional development that cultivates responsive, adaptive classroom practices across varied, rapidly changing educational contexts.

In terms of *Differentiated Instruction*, the statement "I provide extra help for students needing additional learning support" obtained the highest mean of 3.25, described as moderate. On the other hand, the statement "I create different learning paths to accommodate diverse classroom learners" garnered the lowest mean of 2.78, also described as moderate. Overall, the indicator Differentiated Instruction obtained a category mean of 3.00 with a standard deviation of 0.623, interpreted as moderate.

The findings of the study imply that teachers make some effort to tailor tasks, materials, and assistance to learner differences, yet differentiated practices remain limited, indicating a need for training on designing varied pathways that systematically address diverse readiness levels.

In line with these findings, Aranha (2025) reported that teachers often value differentiated instruction but encounter substantial barriers that limit its consistent enactment, including workload, large classes, and limited support. Her case study showed that, without sustained professional learning and structural resources, differentiation tends to remain occasional rather than embedded practice. This supports the present study's indication that teachers' efforts to tailor tasks and assistance are present yet insufficiently developed for fully inclusive, needs-responsive classrooms, especially in diverse, resource-constrained settings.

Among the five statements of the indicator *Reflective Practice*, the statement "I reflect on lesson outcomes to strengthen future instructional approaches" obtained the highest mean of 4.64, described as very high. On the other hand, the statement "I review my teaching strategies to identify areas needing improvement" garnered the lowest mean of 4.58, also described as very high. Overall, the indicator Reflective Practice obtained a category mean of 4.60 with a standard deviation of 0.433, interpreted as very high.

The findings of the study imply that teachers consistently engage in reflective thinking about their strategies, outcomes, and student feedback, suggesting a strong culture of self-evaluation that can support continuous instructional improvement, professional growth, and more responsive, learner-centered classroom practices.

In connection with this strong culture of reflection, Almusharraf (2020) found that engaging student teachers in systematic reflective tasks, such as teaching philosophies and peer observations, significantly deepened their reflection levels and enhanced teaching performance over time. She argued that structured reflection enables educators to scrutinize their beliefs, refine classroom strategies, and bridge the gap between intended and actual practice, thereby fostering continuous professional growth and more responsive, learner-centered instruction. These results underscore reflection as a cornerstone of effective pedagogy.

Students' Engagement Outcomes

Table 2 shows the very high level of Students' Engagement Outcomes. This variable contains four indicators, namely Behavioral Engagement, Emotional Engagement, Cognitive Engagement, and Self-Regulated Learning, and obtained an overall mean score of 4.61 with a standard deviation of 0.397, which reflects a very high level of engagement and the consistency of the respondents' answers.

Looking at *Behavioral Engagement*, the statements "I participate actively in group activities during classroom learning sessions" and "I follow classroom rules and instructions from my teacher consistently" obtained the highest mean of 4.63, described as very high. On the other hand, the statement "I take part in school events that support my learning" garnered the lowest mean of 4.41, described as high. Overall, the indicator Behavioral Engagement obtained a category mean of 4.61 with a standard deviation of 0.4445, interpreted as very high.

The findings of the study imply that students are strongly behaviorally engaged in core classroom tasks, consistently participating, complying with rules, and attending regularly, though their involvement in broader school events is slightly less intense, suggesting opportunities to further strengthen engagement beyond the classroom setting.

Aligning with this pattern of strong classroom participation, King (2020) emphasizes that behavioral engagement is demonstrated when students consistently attend lessons, contribute to discussions, comply with classroom rules, and complete assignments on time. Drawing from intervention studies, she argues that such observable behaviors signal students' investment in learning and predict better academic outcomes, especially when teachers establish clear expectations, provide consistent feedback, and create structured opportunities for active involvement in both classroom tasks and broader school activities for all learners.

With respect to *Emotional Engagement*, the statement "I feel excited whenever learning activities are creative and enjoyable" obtained the highest mean of 4.65, described as very high. On the other hand, the statement "I stay positive in class even during difficult school lessons" garnered the lowest mean of 4.23, described as high. Overall, the indicator Emotional Engagement obtained a category mean of 4.46 with a standard deviation of 0.551, interpreted as high.

The findings of the study imply that students experience positive emotions in response to engaging learning activities and relationships, yet they find it harder to maintain optimism during challenging lessons, highlighting the importance of classroom climate and responsive instruction.

In harmony with this high emotional engagement, Wang et al. (2025) showed that students who frequently experience positive emotions in their learning environments report higher academic engagement, characterized by greater dedication, vigor, and absorption in tasks. Their study further demonstrated that positive emotions flourish in supportive classroom climates and, in turn, help students persist through demanding academic activities, suggesting that creative, enjoyable lessons and encouraging teacher feedback are crucial for sustaining motivation even when coursework becomes challenging for diverse learners.

Considering *Cognitive Engagement*, the statement "I try to improve understanding by reviewing lessons after school" obtained the highest mean of 4.42, described as high. On the other hand, the statement "I connect what I learn in class to real-life" garnered the

lowest mean of 4.31, also described as high. Although the category mean and standard deviation are not indicated, the consistently high item means reflect a high level of cognitive engagement.

The findings of the study imply that students are cognitively engaged, sustaining attention, using strategies, and reviewing lessons, yet there remains room to deepen critical thinking and real-life integration through richer, more challenging tasks and sustained metacognitive support from teachers.

Corroborating this high cognitive engagement, Wallace-Spurgin (2020) found that students' learning improved when classroom technology was intentionally used to promote higher-order thinking, such as problem-solving, critical analysis, and strategic use of learning tools, rather than simple information searching. She reported that when teachers designed tasks requiring sustained attention, reflection, and monitoring of understanding, students showed deeper cognitive involvement in lessons, supporting the idea that well-structured activities and metacognitive guidance can strengthen learners' strategic review and persistence, especially in demanding subjects.

Regarding *Self-Regulated Learning*, the statement "I manage my time wisely to balance study and play" obtained the highest mean of 4.70, described as very high. On the other hand, the statement "I motivate myself to continue studying even when tired" garnered the lowest mean of 4.55, also described as very high. Overall, the indicator Self-Regulated Learning obtained a category mean of 4.62 with a standard deviation of 0.431, interpreted as very high.

The findings of the study imply that students consistently exercise self-regulation, managing their time, setting goals, and adjusting strategies when faced with difficulties, which can foster sustained academic persistence, independent learning habits, and higher achievement even in demanding instructional contexts.

In support of these very high self-regulation scores, Yu (2022) argued that learners who actively set goals, manage their time, choose effective strategies, and monitor progress achieve stronger academic outcomes, especially in demanding online environments. Synthesizing self-regulated learning theories and empirical findings, he concluded that such strategic behaviors foster persistence, adaptability, and sustained motivation, highlighting the importance of explicitly teaching self-management processes so students maintain high performance even when tasks become complex and difficult across subjects, grade levels, and contexts.

Classroom Interaction

Table 3 shows the high level of Classroom Interaction. This variable contains four indicators, namely Teacher–Student Communication, Student Participation, Feedback Exchange, and Collaborative Learning Activities, and obtained an overall mean score of 4.33 with a standard deviation of 0.318, which reflects a high level of classroom interaction and the consistency of the respondents' answers.

Examining the indicator *Teacher–Student Communication*, the statement "I communicate openly with my teacher about my learning difficulties" obtained the highest mean of 4.67, described as very high, while the statement "I listen carefully when my teacher explains new subject concepts" recorded the lowest mean of 4.61, though still described as very high. Overall, the indicator Teacher–Student Communication obtained a category mean of 4.64 with a standard deviation of 0.419, interpreted as very high.

The findings imply that students experience highly open, clear, and supportive communication with their teachers, freely asking questions, expressing concerns, and receiving understandable instructions. Such strong communicative relationships may enhance understanding, confidence, and willingness to seek help, thereby promoting more meaningful and effective classroom learning.

Consistent with these very high ratings of teacher–student communication, Salamondra (2021) emphasized that effective communication in schools grounded in trust, transparency, and active listening creates positive classroom relationships that support students' learning outcomes. She argued that when teachers clearly explain expectations, invite questions, and genuinely listen to learners' concerns, students feel safe to participate, seek clarification, and respond to feedback. Such communicative climates, according to her analysis, are foundational for building confidence, sustaining engagement, and promoting meaningful academic progress across diverse subjects.

Among the five statements under the indicator *Student Participation*, the statement "I contribute ideas during problem-solving activities with my classmates" obtained the highest mean of 4.68, described as very high, while the statements "I join classroom discussions by sharing ideas with classmates willingly" and "I raise my hand to answer questions during class recitations" recorded the lowest mean of 4.59, though still described as very high. Overall, the indicator Student Participation obtained a category mean of 4.62 with a standard deviation of 0.422, interpreted as very high.

The findings imply that students are highly participative, especially in collaborative and problem-solving tasks, suggesting an active learning environment where learners willingly engage, share ideas, and respond during lessons, which can further enrich peer interaction and deepen understanding through collective classroom involvement.

In line with this very high level of student participation, Parker-Shandal (2023) found that active contributions to classroom discussions deepen students' engagement and support perspective taking, particularly when learners feel safe to share ideas. Her study showed that inclusive, discussion-rich environments encourage students to voice opinions, negotiate meaning, and collaborate with peers, which strengthens academic learning and social belonging. These findings affirm that frequent, willing participation in problem-solving tasks can meaningfully enrich understanding and classroom community for all learners involved.

In the case of *Feedback Exchange*, the statement "I apply teacher feedback to improve performance in future tasks" obtained the highest mean of 4.67, described as very high, while the statement "I share constructive feedback with peers during class discussions" recorded the lowest mean of 4.62, though still described as very high. Overall, the indicator Feedback Exchange obtained a category mean of 4.64 with a standard deviation of 0.496, interpreted as very high.

The findings imply that feedback is actively listened to, applied, and exchanged among teachers and students, fostering a constructive learning climate where learners value comments, reflect on them, and use them to enhance future performance and the quality of collaborative classroom outputs.

In harmony with the implication of feedback exchange, Adarkwah (2021) described assessment feedback as a key driver of teaching and learning when it is specific, timely, and constructive. Reviewing 82 studies, he concluded that students benefit most when feedback is clearly understood and directly applied to improve later work, whereas vague

or negative comments may weaken motivation. His review supports the present findings that learners who attend to, reflect on, and use feedback are more likely to enhance subsequent academic performance.

Finally, for *Collaborative Learning Activities*, the statements “I share resources and ideas during collaborative classroom learning activities” and “I support my classmates when they struggle with group activities” obtained the highest mean of 3.15, described as moderate, while the statement “I contribute equally to group work for fair task completion” recorded the lowest mean of 3.01, also described as moderate. Overall, the indicator Collaborative Learning Activities obtained a category mean of 3.06 with a standard deviation of 1.42, interpreted as moderate.

The findings imply that while students participate in group work and show some cooperation, their collaborative practices are not yet strong or consistent, suggesting a need to strengthen structures, roles, and guidance in group activities to promote more equitable contribution, mutual support, and deeper shared responsibility for learning.

Echoing these moderate collaborative practices, Ghavifekr (2020) reported that Malaysian secondary students viewed collaborative learning as beneficial for academic, social, and lifelong skills, yet also identified issues like uneven participation and difficulty getting all members to contribute actively. She emphasized that clear task structures, appropriate group size, and strong teacher facilitation are crucial for promoting shared responsibility, mutual support, and more productive teamwork in class-based projects and activities, particularly when collaboration skills are still emerging among younger learners over time.

Relationship between the Variables

Table 4 presents the results of the correlational analysis between Teachers’ Pedagogical Adaptability and Classroom Interaction, Teachers’ Pedagogical Adaptability and Students’ Engagement Outcomes, and Classroom Interaction and Students’ Engagement Outcomes. The results indicate that Teachers’ Pedagogical Adaptability has a significant relationship with both Classroom Interaction and Students’ Engagement Outcomes. Likewise, Classroom Interaction is significantly related to Students’ Engagement Outcomes. All correlations are significant at the .01 level, indicating moderate to high positive associations among the variables.

In the case of *Teachers’ Pedagogical Adaptability and Classroom Interaction*, the correlation yielded a p-value of .000, which is less than the 0.01 level of significance, indicating that a significant relationship can be inferred between the two variables. With a moderate positive degree of correlation ($r = .534$), the null hypothesis, “There is no significant relationship between Teachers’ Pedagogical Adaptability and Classroom Interaction,” is consequently rejected.

These findings imply that as teachers become more adaptable in their instructional practices, classroom interaction also tends to improve. Enhancing flexibility, differentiation, and reflective practice may therefore help create more communicative, participatory, and responsive classroom environments where students feel more engaged and involved in learning processes.

Supporting this link between adaptable teaching and richer classroom interaction, Chen (2022) described pedagogical adaptability as an essential capacity that enables early childhood teachers to adjust instruction in response to learners’ needs, context

shifts, and feedback during remote teaching. Her findings showed that teachers who consciously adapted activities, communication strategies, and learning supports were better able to sustain participation and meaningful teacher–child exchanges. This suggests that cultivating adaptability can directly further enhance the quality and responsiveness of day-to-day classroom interactions.

Particularly, the reported results demonstrate that the correlation between *Teachers' Pedagogical Adaptability and Students' Engagement Outcomes* yielded a p-value of .001, which is less than the 0.01 level of significance, indicating that a significant relationship can be inferred between the two variables. With a moderately high positive degree of correlation ($r = .669$), the null hypothesis, "There is no significant relationship between Teachers' Pedagogical Adaptability and Students' Engagement Outcomes," is consequently rejected.

These findings imply that higher levels of adaptability in teachers' instructional practices are associated with increased student engagement in behavioral, emotional, cognitive, and self-regulated aspects. Strengthening flexibility, differentiated strategies, and reflective practice may therefore provide a practical pathway for promoting more active, motivated, and self-directed learners over time.

In line with this significant association, Chowdhury (2024) showed that pedagogical innovation shifting from traditional, teacher-centered chalkboard teaching to more interactive, technology-supported lessons substantially enhance student engagement. Using survey and case study data, she found that when teachers flexibly adapt methods and tools to create active learning environments, students display greater attention, participation, and enthusiasm. Her work supports the view that adaptable, innovative teaching practices are closely linked to stronger engagement outcomes. This underscores prioritizing teacher adaptability in classrooms facing diverse learners.

Regarding *Classroom Interaction and Students' Engagement Outcomes*, the correlation yielded a p-value of .004, which is less than the 0.01 level of significance, indicating that a significant relationship can be inferred between the two variables. With a high positive degree of correlation ($r = .771$), the null hypothesis, "There is no significant relationship between Classroom Interaction and Students' Engagement Outcomes," is consequently rejected.

These findings imply that enhanced classroom interaction through communication, participation, feedback, and collaboration is strongly associated with higher levels of behavioral, emotional, cognitive, and self-regulated engagement among students. Building richer, more interactive classroom environments may therefore be a powerful strategy for sustaining students' active involvement and motivation in learning over time.

Parallel to this strong association between classroom interaction and engagement, Kong (2021) argued that experiential learning environments where students actively participate in tasks, discuss ideas, and apply knowledge to real situations substantially enhance classroom engagement and motivation. In his conceptual review, he emphasized that participation, interaction, and application are core features of experiential classes, allowing learners to collaborate, seek feedback, and reflect on their progress. Such interaction-rich settings thus help sustain behavioral, emotional, and cognitive engagement across diverse learning contexts.

Table 4
Relationship between the Variables

VARIABLES	R	p-value	Remarks
Teachers' Pedagogical Adaptability and Classroom Interaction	.534	.000	Significant
Teachers' Pedagogical Adaptability and Students' Engagement Outcome	.669	.001	Significant
Classroom Interaction and Students' Engagement Outcome	.771	.004	Significant

*Highly Significant at .01 level

Predictors of Students' Mathematics Performance

Table 5 reveals the results of the regression analysis showing that Teachers' Pedagogical Adaptability and Classroom Interaction, taken together, have a significant and substantial influence on Students' Engagement Outcomes, as indicated by the overall model fit ($R = .885$, $R^2 = .783$, $F = 524.270$, $p < .05$).

It was found that Teachers' Pedagogical Adaptability ($B = .278$, $p = .002$) is a significant predictor of Students' Engagement Outcomes in the regression model. This means that for every one-unit increase in Teachers' Pedagogical Adaptability, a .278 unit increase in Students' Engagement Outcomes can be expected, holding Classroom Interaction constant.

The result implies that enhancing teachers' adaptability through greater flexibility, differentiated instruction, and reflective practice can lead to higher levels of behavioral, emotional, cognitive, and self-regulated engagement among students, even when classroom interaction is already accounted for.

In line with this regression finding, Chen (2022) showed that first-year early childhood teachers who developed greater pedagogical adaptability through reflective practice were better able to adjust instruction to learners' needs and remote teaching demands, thereby sustaining children's participation and learning opportunities. She argued that adaptive instructional decisions such as modifying activities, pacing, and support enhance engagement by keeping tasks appropriately challenging and responsive to students' interests, difficulties, and feedback, underscoring the value of strengthening teachers' adaptive capacities.

Similarly, it was also found that Classroom Interaction ($B = .615$, $p = .000$) is a significant and stronger predictor of Students' Engagement Outcomes in the regression model. This means that for every one-unit increase in Classroom Interaction, a .615 unit increase in Students' Engagement Outcomes can be expected, holding Teachers' Pedagogical Adaptability constant.

The result implies that strengthening classroom interaction through richer communication, active participation, constructive feedback, and collaborative activities can substantially boost students' behavioral, emotional, cognitive, and self-regulated engagement, even when teachers' adaptability is already considered in the model.

In agreement with this strong predictive role of classroom interaction, Wang and Eccles (2021) highlighted that students’ perceptions of frequent, supportive classroom interactions are closely linked to higher emotional and behavioral engagement. Using multilevel analyses, they found that when students experience constructive exchanges with teachers and peers, they are more likely to participate actively, invest effort, and remain involved in learning activities. Their findings reinforce that rich interaction patterns in class can substantially enhance overall engagement.

Table 5
Influence of Teachers’ Pedagogical Adaptability and Classroom Interaction on Students’ Engagement

Variables	Unstandardized Coefficients		Standardized Coefficient	T	p-value	Remarks
	B	Std. Error	Beta			
(Constant)	.520	.131		3.978	.000	
Teachers’ Pedagogical Adaptability	.278	.153	.276	2.358	.002	Significant
Classroom Interaction	.615	.051	.731	3.952	.000	Significant

Note: R=.885^a, R-square=.783, F=524.270, P<.05

Mediating Effect of Classroom Interaction between Pedagogical Adaptability and Students Engagement Outcomes

Table 6 shows the use of MedGraph involving the Sobel Test to analyze the significance of the mediation effect of Classroom Interaction between Teachers’ Pedagogical Adaptability and Students’ Engagement Outcomes. As can be gleaned in the figure, the direct effect of Teachers’ Pedagogical Adaptability on Students’ Engagement Outcomes decreases markedly from a total effect of $\beta = .669$ to a direct effect of $\beta = .276$ when the mediating variable Classroom Interaction is placed in the model. Because this reduction is substantial while the direct effect remains significant, the pattern supports a meaningful partial mediation effect.

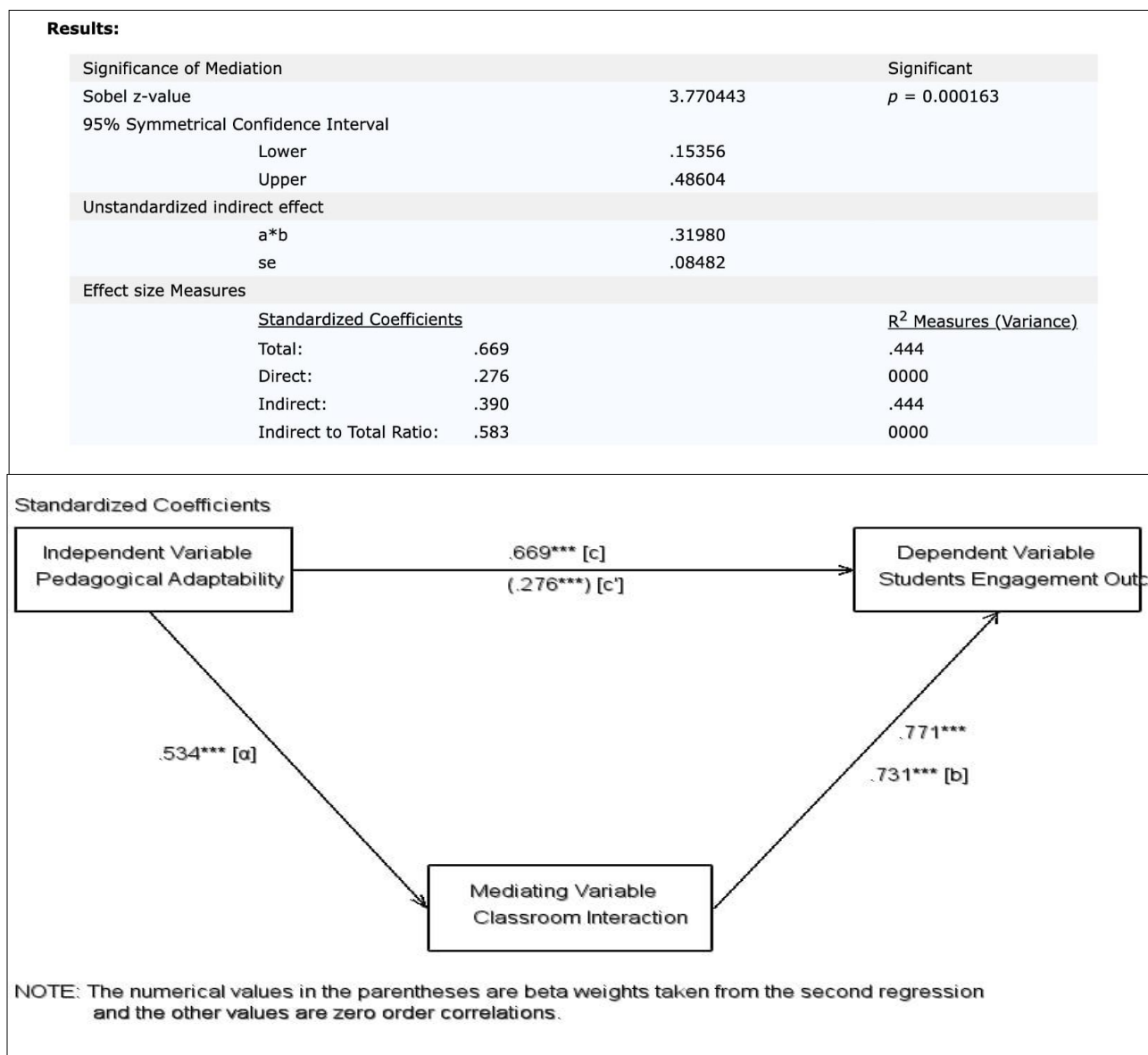
Meanwhile, the Sobel Test denotes that there is a significant mediation taking place in the model ($z = 3.770443$, $p = 0.000163$), because the p-value is far below the 0.05 level of significance and the 95% confidence interval for the indirect effect (0.15356 to 0.48604) does not include zero. This means that Classroom Interaction significantly carries the effect of Teachers’ Pedagogical Adaptability onto Students’ Engagement Outcomes, indicating that adaptable teachers enhance engagement in large part by fostering richer interaction patterns in the classroom.

On the other hand, the effect size indices show that the standardized indirect effect is relatively large ($\beta = .390$), while the total effect is $\beta = .669$ and the direct effect is $\beta = .276$. The indirect-to-total ratio of .583 indicates that about 58.3% of the overall effect of Teachers’ Pedagogical Adaptability on Students’ Engagement Outcomes can be

attributed to the indirect path through Classroom Interaction, with the remaining proportion operating through a direct pathway or other factors not included in the model.

Resonating with this mediated pathway, Li (2021) argued that in flipped learning contexts, teacher–student interpersonal relations act as a key interactional process through which instructional practices translate into higher student engagement. Synthesizing prior empirical work, he showed that when teachers foster rich dialogue, collaborative tasks, and continuous feedback, students’ interest, participation, and persistence in learning activities increase markedly. This supports the present finding that classroom interaction is a central mechanism linking adaptable teaching practices to stronger engagement outcomes.

Table 6
Mediating Analysis



QUALITATIVE STRAND

This part presents qualitative findings from interviews and group discussions, explaining how teachers' pedagogical adaptability and contextual factors influence classroom interaction and students' sustained engagement across flexible, multimodal learning environments.

Essential Themes that Emerged from the Lived Experiences of Teachers on Pedagogical Adaptability, Classroom Interaction, and Students' Engagement

This section discusses six main themes that arose from the in-depth interviews and focus group discussions with the participants. The succeeding table depicts these themes as the respondents' assessment in analyzing the lived experiences of teachers' pedagogical adaptability, classroom interaction, and students' engagement outcomes, namely: Flexibility and Multimodal Instruction as Central to Engagement, Differentiated Instruction Through Representation as Standard Practice, Active Learning and Peer-Led Formats as Engagement Accelerants, Feedback Loops and Real-World Connections Sustain Motivation, Participation Markers Signal Stronger Engagement Across Modalities, and Context Factors Act as Moderators of Engagement Gains from Adaptive Teaching

Flexibility and Multimodal Instruction as Central to Engagement. Teaching in multimodal environments requires flexible structures that allow students to participate meaningfully even when they face schedule, access, or connectivity constraints. When teachers varied modalities, schedules, and submission options, they were able to sustain learners' presence and participation across changing conditions.

"I used discussion boards for late responses. Students who missed live classes still engaged thoughtfully afterward." (IDI_P8)

"Flexible submissions kept everyone productive even with schedule conflicts." (FGD_P4)

"Blending online and face-to-face sessions helped sustain attention. It gave flexibility and variety to learning." (FGD_P6)

"Maintaining emotional connection online is tough. Without facial cues, it's hard to sense interest, frustration, or confusion." (IDI_P4)

"Internet outages during online classes force me to pause lessons." (IDI_P4)

"Students used chat boxes and polls actively in online classes." (FGD_P9)

The comments made by the participants gave the impression that flexible, multimodal arrangements are crucial in keeping students connected to learning while also requiring new ways of "seeing" engagement across platforms.

This view aligns with the study on blended and flexible learning, which suggests that combining face-to-face and online modes can enhance student engagement and persistence when designed with access and interaction in mind. In such environments,

teachers must deliberately align engagement indicators across modalities so that students' participation remains visible and supportable, even when learning shifts between physical and virtual classrooms (Han, 2025).

Differentiated Instruction Through Representation as Standard Practice.

Differentiated instruction in this study refers to the way teachers adjust pacing, explanations, and task formats so that learners with varying readiness levels can access the same lesson. Rather than relying on a single way of presenting content, teachers deliberately use multiple representations, additional scaffolds, and varied outputs to ensure that more students can follow, participate, and succeed during classroom interaction.

"I adjusted pacing based on student feedback. Slower learners got more support, and faster ones had extension tasks." (IDI_P2)

"I simplified instructions for complex topics. It helped students with weaker backgrounds understand key points faster." (IDI_P4)

"Students felt included when lessons matched their learning pace." (FGD_P7)

"I personalized feedback according to each student's progress. It motivated improvement and responsibility." (IDI_P9)

"I revised lesson plans based on quiz results. It addressed gaps early and improved outcomes." (IDI_P10)

"Flexible tasks respected individual strengths. Students performed better." (FGD_P2)

Taken together, the statements of the participants imply that differentiated instruction through varied representations of content, adjusted pacing, scaffolded explanations, flexible tasks, and personalized feedback has become a standard classroom practice for promoting inclusive engagement.

Teachers use ongoing evidence of learning (such as quizzes and student feedback) to refine lessons and ensure that more students can participate meaningfully, regardless of initial readiness. This view echoes recent work on differentiated instruction, which recognizes it as a key approach for addressing diverse abilities and fostering inclusive classrooms where all learners can access, engage with, and demonstrate understanding of the curriculum (Ardenlid et al., 2025).

Active Learning and Peer-Led Formats as Engagement Accelerants. Active learning in this study refers to instructional approaches that move students from passive listening to active participation in tasks, discussions, and problem solving. Teachers described how group activities, peer-led projects, and structured peer evaluation created shared responsibility for learning and helped sustain students' focus and interaction during class.

"Group activities improved collaboration and teamwork among students. They learned to divide roles and solve problems collectively." (FGD_P2)

“Group projects encouraged collaboration. Students interacted better and learned teamwork while staying focused on goals.” (FGD_P2)

“We used peer evaluation to build accountability. Students valued honest feedback and improved their performance.” (FGD_P5)

“Students submitted work earlier than deadlines. This showed improved focus and responsibility.” (IDI_P3)

“They volunteered to present without hesitation. Confidence and enthusiasm increased.” (IDI_P4)

“Students volunteered to help peers who struggled.” (FGD_P4)

The remarks of the participants imply that when classroom interaction shifts from listening to shared task work, students become more engaged, responsible, and collaborative. Group activities, peer evaluation, and student-led presentations appear to accelerate engagement by giving learners clear roles, voice, and influence over the learning process.

This theme is supported by Driessen et al. (2024), who found in a meta-analysis that group work as an active learning strategy significantly enhances student performance and remains effective across different class and group sizes, underscoring the value of collaborative, peer-led formats for promoting engagement and learning.

Feedback Loops and Real-World Connections Sustain Motivation. Feedback loops refer to regular cycles where teachers listen to students' responses, adjust activities, and invite further input, while real-world connections refer to tasks and examples anchored in learners' everyday lives and communities. Participants described how combining these two elements continuous feedback and authentic, life-based tasks helped sustain students' motivation and sense of ownership over learning.

“I gave project options suited to various interests. Students worked with motivation and creativity.” (IDI_P3)

“I used flexible assessment formats like reports, videos, or infographics. Students expressed understanding through preferred methods.” (IDI_P7)

“Real-life examples increased understanding across diverse learners.” (FGD_P3)

“I created project-based tasks related to their communities. Students took ownership of their learning.” (IDI_P6)

“Encouraging open feedback every week increased trust and made learning a shared responsibility.” (IDI_P10)

“We noticed more participation when activities involved real-world examples. Students became eager to share their experiences.” (FGD_P1)

The remarks of the participants suggest that motivation is sustained when students recognize the relevance of classroom work to their own lives and see that their feedback leads to visible adjustments in teaching.

Choice-based projects, flexible assessment outputs, and community-linked tasks allow learners to express understanding in personally meaningful ways, while frequent, open feedback cycles build trust and a shared sense of responsibility for learning. This interpretation is consistent with work showing that timely, formative feedback can significantly support students' motivation and engagement in their courses (Fisher et al., 2025).

Participation Markers Signal Stronger Engagement Across Modalities.

Participation markers refer to the visible behaviors and outcomes that signal whether students are behaviorally, emotionally, and cognitively engaged in class, whether lessons are conducted face-to-face or online. Teachers described how they tried to connect their adaptive strategies to concrete indicators such as student talk, questions, and quality of work but also how difficult it was to see and balance all three domains of engagement within limited instructional time.

“Balancing all three types together is hard. Improving one sometimes lowers another, especially when time is short.” (IDI_P9)

“Behavioral engagement is hardest. Some students attend but stay quiet throughout.” (FGD_P1)

“Cognitive depth requires more time than schedules allow.” (FGD_P7)

The ideas of the participants imply that teachers increasingly look beyond simple attendance to identify genuine engagement. For them, stronger engagement is signaled when students speak up, ask questions, participate in discussion, and produce more thoughtful work not just when they log in, sit in class, or submit a requirement.

This understanding is consistent with Murphy, Nixon, and Yeo (2022), who found that participation and engagement may be expressed through different behaviors in online and face-to-face classes, and that teachers must learn to interpret a wider range of participation markers when learning shifts across modalities.

Context Factors Act as Moderators of Engagement Gains from Adaptive Teaching. Context factors refer to elements beyond individual classrooms such as professional development opportunities, availability of resources, workload and policy conditions, and the broader professional culture that can either strengthen or weaken the effects of adaptive teaching on student engagement. Participants emphasized that even well-designed adaptive strategies depend on adequate time, tools, and institutional support to be implemented consistently.

“Regular workshops on differentiated instruction help teachers design lessons suited for mixed abilities.” (IDI_P1)

“Training on digital tools and learning platforms improves adaptability.” (IDI_P2)

*“Training in emotional intelligence supports better classroom relationships.”
(FGD_P6)*

“Providing modern instructional resources like smart projectors, stable internet, and updated materials helps teachers design creative, interactive lessons.” (IDI_P2)

“Technology failures disrupt lessons. Poor connectivity and limited tools affect both teaching flow and student engagement.” (FGD_P2)

“Outdated equipment affects the success of interactive lessons.” (FGD_P5)

“Schools should lessen administrative loads such as reports and paperwork.” (IDI_P3)

*“Policies promoting smaller class sizes enable personalized learning.”
(IDI_P7)*

“We struggle balancing innovation with workload. Administrative tasks reduce preparation time for new methods.” (FGD_P1)

*“Institutions must provide continuous mentoring or coaching programs.”
(IDI_P5)*

“Schools can build collaborative teacher communities. Sharing best practices and lesson innovations enhances creativity.” (IDI_P7)

*“Recognition programs motivate teachers to maintain adaptive practices.”
(FGD_P5)*

The ideas of the participants imply that adaptive teaching does not operate in isolation from its environment. Engagement gains are more likely when teachers have access to focused training, reliable technology and facilities, manageable workloads, and a school culture that values coaching, collaboration, and recognition.

This interpretation is supported by Hanaysha, Shriedeh, and In'airat (2023), who found that classroom environment, teacher competency, ICT resources, and university facilities significantly predicted student engagement and academic performance, underscoring how school-level conditions moderate the impact of teaching practices on learner outcomes.

Joint display of Quantitative and Qualitative Results

Table 9 reveals the salient quantitative and qualitative results and presents the nature and purpose of data integration in this study. It shows how the numeric patterns from the survey align with, confirm, and deepen the narratives generated from the in-depth interviews and focus group discussions.

Table 9
Joint display of Quantitative and Qualitative Results

Research Area	Quantitative Phase	Qualitative Phase	Nature of Integration	Axiological implication
<p>Status of three variables</p> <p>1.1. teachers' pedagogical adaptability</p>	<p>The level of Teachers' Pedagogical Adaptability obtained an overall mean of 4.59 with a standard deviation of 0.384, interpreted as a very high level of teachers' pedagogical adaptability. Instructional Flexibility (M = 3.01) and Differentiated Instruction (M = 3.00) were described as moderate, while Reflective Practice (M = 4.60) was described as very high, reflecting a strong culture of reflection and consistency in the responses of the participants.</p>	<p>Participants narrated lived experiences that mirror these indicators, which later formed the essential themes "<i>Flexibility and Multimodal Instruction as Central to Engagement</i>" and "<i>Differentiated Instruction Through Representation as Standard Practice.</i>" They described how they adjust pacing, simplify instructions, personalize feedback, and revise lesson plans based on student performance and feedback, confirming the prominence of reflective practice while also revealing ongoing efforts and constraints in everyday instructional flexibility and differentiation.</p>	<p>Confirming, Merging, Connecting</p>	<p>The results imply that teachers' pedagogical adaptability especially reflective practice plays a crucial role in sustaining meaningful interaction and engagement. However, the moderate quantitative ratings and the qualitative accounts both signal a need to further strengthen day-to-day instructional flexibility and differentiated pathways so that diverse learners are systematically supported in rapidly changing classroom contexts.</p>
<p>1.2. students' engagement outcomes</p>	<p>Classroom Interaction obtained an overall mean of 4.33 with a standard deviation of 0.318, interpreted as a high level of classroom interaction. Teacher–Student Communication (M = 4.64), Student Participation (M = 4.62), and Feedback Exchange (M = 4.64) were all very high, while Collaborative Learning Activities (M = 3.06) were only at a moderate level, indicating strong communicative and feedback practices but less</p>	<p>Participants' experiences confirmed these patterns through themes such as "<i>Active Learning and Peer-Led Formats as Engagement Accelerants</i>" and "<i>Participation Markers Signal Stronger Engagement Across Modalities.</i>"</p>	<p>Confirming, Merging, Connecting</p>	<p>The integration suggests that classrooms are generally interaction-rich, with strong communication and feedback practices that support engagement. However, the moderate level of collaborative learning—echoed</p>

	consistent use of group-based collaboration.	They described active questioning, peer evaluation, willingness to present, and helping behaviors as signs of strong interaction, but also acknowledged challenges in sustaining collaborative group work and translating interaction into deeper cognitive engagement, especially under time and resource constraints.		in the qualitative reports— highlights the value of intentionally expanding structured group activities and peer-led formats so that interaction does not remain teacher-centered but becomes more genuinely collaborative and empowering for students.
1.3. classroom interaction	Students' Engagement Outcomes reached an overall mean of 4.61 with a standard deviation of 0.431, interpreted as a very high level of students' engagement outcomes. Behavioral Engagement (M = 4.61) and Self-Regulated Learning (M = 4.62) were very high, while Emotional Engagement (M = 4.46) and Cognitive Engagement (M = 4.36) were rated high, indicating that students generally participate actively, manage their learning, and maintain positive attitudes and thoughtful involvement in classroom tasks.	Qualitative findings supported these results through themes such as <i>"Feedback Loops and Real-World Connections Sustain Motivation"</i> and <i>"Participation Markers Signal Stronger Engagement Across Modalities."</i> Participants recounted early submissions, volunteering to present, helping peers, and increased participation when lessons were connected to real-life and community contexts. At the same time, they noted that some students remained quiet and that deeper cognitive engagement requires more time and deliberate planning, especially in online or multimodal settings.	Confirming, Merging, Connecting	The convergent evidence indicates that students are generally highly engaged, responsible, and motivated, especially when teaching is adaptive, interactive, and linked to real-life contexts. Nevertheless, both phases underscore the ethical and practical need to attend to "quieter" or less visible forms of engagement and to create more opportunities for cognitive depth, ensuring that all learners not only the most vocal benefit from high levels of engagement across modalities.

CONCLUSIONS

Based on the summary of findings from the quantitative and qualitative results, the following conclusion may establish:

1. Teachers' pedagogical adaptability is very high, especially in reflective practice. However, instructional flexibility and differentiated instruction are only moderate, indicating the need for further support to consistently adjust content, pacing, and tasks for diverse learners.
2. Students' engagement outcomes are very high overall. Learners are generally active, responsible, and motivated, showing strong behavioral and self-regulated engagement, with high emotional and cognitive engagement when teaching is responsive to their needs and learning contexts.
3. Classroom interaction is high, with very strong communication, participation, and feedback exchange, but only moderate collaborative learning. This indicates that interaction is rich yet still needs more structured group work and peer collaboration to become more student-led.
4. Significant positive relationships exist among teachers' pedagogical adaptability, classroom interaction, and students' engagement outcomes. More adaptable teachers working in interaction-rich environments tend to have students who are more engaged behaviorally, emotionally, cognitively, and in terms of self-regulated learning.
5. Teachers' pedagogical adaptability significantly predicts students' engagement outcomes. When teachers frequently adjust strategies, differentiate tasks, and reflect on their practice, students display higher levels of participation, motivation, thoughtful involvement, and responsibility for their own learning.
6. Classroom interaction significantly mediates the relationship between teachers' pedagogical adaptability and students' engagement outcomes. Adaptable teaching supports engagement partly by enhancing communication, participation, feedback, and collaboration in class, making interaction a key pathway through which adaptability benefits learners.
7. Six qualitative themes emerged: flexibility and multimodal instruction, differentiated representation, active and peer-led learning, feedback and real-world relevance, visible participation markers, and contextual moderators. These show that engagement is strongest when teaching is flexible, relevant, participatory, and supported by favorable institutional conditions.
8. Quantitative and qualitative findings were confirming, merging, and connecting. Both strands converged to show that teachers' pedagogical adaptability, channeled through strong classroom interaction, is central to sustaining high levels of student engagement in the studied schools.

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