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ORIGINAL ARTICLE

A Mixed-Methods Study on the Teaching Style of KCAST Mathematics Instructors from the Perspective of Education Students

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ABSTRACT

This study aimed to identify the perception of education students about the teaching styles of mathematics teachers in terms of learning experiences and engagements at KCAST. For this analysis, a concurrent parallel mixed-method design was adopted, with the integration of quantitative and qualitative data. The Likert-scale questionnaire used had already been validated to measure five teaching styles: authority, delegator, demonstrator, facilitator, and hybrid. From the quantitative analysis, all teaching styles were rated highly, though the hybrid teaching style received the highest mean score, followed by facilitator and demonstrator styles. This attests to the flexibility in the way mathematics teachers deliver lessons, using one method or another depending on the time and the situation. Themes that emerged in the qualitative findings through FGDs and IDIs were adaptive learning strategies, enhanced student engagement, and optimization of teaching methods to attain appropriate classroom interaction. Merging the two sets of findings shows that the diversity and adaptability of teaching styles facilitate the students' active participation, collaboration, and critical thinking. In the end, the study concludes that good mathematics teaching requires a balance of structured, teacher-centered activities with interactive, student-centered learning to highlight meaningful and independent learning processes.

Keywords: *teaching style, mixed method, teacher education students, mathematics education, Philippines*

Recommended Citation

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INTRODUCTION

Teaching style in mathematics is obviously another critical determinant affecting students' mathematical achievement and disposition towards the discipline. Most learning shortcomings result from the effectiveness of the pedagogical styles that encourage rote memorization and adherence to formulas. These methods often make no provision for the many students with different preferences for learning and are more inclined towards social or artistic sciences. Students will not enjoy studying math, and definitely will not understand it, if instruction does not allow experimentation with different learning techniques that align with individual experiences. It is definitely about motivation and participation. Being aware of different learning styles can help a teacher establish a more positive, productive relationship with mathematics and increase his or her overall learning (Cardino et al., 2020).

Mathematics teaching in general, and in Malaysia, is often typified by traditional pedagogies emphasizing memorization and standardized testing. Such practices make mathematics meaningless, leading to disengagement and negative attitudes in a great number of educators who cannot get used to an innovative approach aimed at the development of key competencies, namely, student empowerment and self-directed learning. Unsufficient teacher training and support further heighten this challenge, and a gap is created in using strategies against the needs of diverse learners. As a result, there are fewer opportunities for students to engage meaningfully with mathematical ideas; this confronts them in their later years when critical thinking and problem-solving are required in a knowledge-based economy (Zakaria et al., 2024).

A lot of Filipino math teachers, especial in the Ilocos, struggle to get their students to enjoy the subject. Many young students have bad opinions about math when they first enter the room and that causes ongoing problems with the progress of basic number skills. These early problems may leave them unprepared for more advanced topics as they get older, and affect their overall school performance. Teaching methods that build key numeracy skills, help different kinds of learners, and create a positive and fun learning space are all necessary to combat these issues. While strategies like interactive lessons, visualization, and deliberate practice can be effective, they only work if teachers collaborate as a team, get support, and improve their techniques reflectively as emphasized by (Boud, 2022).

It is, therefore, very timely and important to conduct a mixed-method study on the teaching styles of KCAST instructors from a mathematics education student perspective. By examining how students perceive different teaching styles, this study aims to identify effective instructional strategies that improve engagement, retention, and learning outcomes in mathematics. This will also contribute to curriculum relevance, reflective practice by instructors, and alignment of teaching methods with current educational standards. Studies such as Ridwan et al. (2019) and (Omari et al,.2023) have investigated the relationship between teaching styles and students' approaches to learning. In this present study, the focal point is strictly on the teaching practices of mathematics instructors at KCAST, using a mixed-methods approach in order to reach a comprehensive understanding of their instructional strategies.

The results of this study will therefore be shared with instructors, school administrators, and the broader academic community via webinars, seminars, peer-reviewed publications, conference presentations, and accessible infographics. Community forums and newsletters in partnership with KCAST will further ensure local engagement. A six-month distribution timeline, complemented with feedback assessments and engagement metrics, will enable ongoing discussion and implementation of best instructional practices that contribute to improved mathematics teaching and learning.

Research Questions

1. What is the status of the teaching style of KCAST instructor?
2. What are the lived experience and coping mechanism of the instructors as regard to their Teaching Style?
3. To what extent do the quantitative data corroborate with the qualitative data?
4. What intervention scheme can be proposed based on the results?

METHODS

Study Design

A convergent parallel mixed-method design was used, combining quantitative and qualitative approaches as the key strength of the study, to allow for simultaneous data collection, separate analysis, and integrated interpretation that gave a comprehensive understanding of mathematics teachers' teaching styles at KCAST. This quantitative approach used a descriptive research design in which a validated five-point Likert scale was used to measure the frequency and extent of five teaching style indicators, namely, authority, delegator, demonstrator, facilitator, and hybrid, as perceived by students. Its qualitative counterpart utilized phenomenological methods, specifically focus group discussions and in-depth interviews, to explore the lived experiences and insights of its participants regarding teaching methods. Integration did not stop at comparing data side by side; rather, the qualitative findings explained and developed the patterns that occurred in the quantitative results, such as the high mean scores for facilitator and hybrid styles, supported by themes of adaptive teaching, interactive engagement, and responsiveness to diverse learning needs. This was a study based on a pragmatic world view, enabling this researcher, who is also a mathematics education student, to draw conclusions from numerical and narrative data, anchored on Vygotsky's Sociocultural Theory, Piaget's Constructivist Learning Theory, and Sweller's Cognitive Load Theory, that emphasized the notion that learning is socially and culturally embedded, is constructed through experience and interaction, and is enhanced when cognitive load is managed effectively. All in all, this design and theoretical underpinning have yielded richer and more cohesive insights on how teaching styles influence engagement, autonomy, collaboration, and deeper mathematical understanding and carry implications for future teaching practice.

Population and Sample

The target population of the study consisted of all students enrolled in the Bachelor of Secondary Education major in Mathematics (BSED–MATH) program at the Kapalong College of Agriculture, Sciences, and Technology for the school year 2024–2025.

These students were represented by first to fourth year students and were the respondents for the quantitative phase of the research. In order to get equal representation, the researcher applied the stratified random sampling method, which involves splitting the population into strata based on year level and then drawing participants from each stratum in proportion to its size. This approach allowed for equal representation of students in each academic year, reducing bias and ensuring that data obtained reflected not just the sentiments of the whole population but also those of first year students and the last year students. The total number of students was 194, and out of this number, 131 participants were drawn as the sample, about 67.34% of the total population. The number of the sample was adequate for the quantitative analysis of teaching styles to deliver reliable statistical data. The inclusion criteria stated that participants must be officially enrolled bsed–Math students who had either

taken or were currently taking mathematics subjects under KCAST instructors. This rigorous selection process meant that all respondents had a relevant and direct experience with the teaching practices being investigated and therefore, it increased the study's findings' validity and reliability.

Instrumentation

The study utilized two primary research instruments aligned with the quantitative and qualitative phases of the mixed-method design. For the quantitative phase, a structured survey questionnaire originally developed by Styx (2023) was adopted to assess the teaching styles of KCAST mathematics instructors. The instrument consisted of 25 items rated on a five-point Likert scale ranging from "Never" to "Always," measuring five core indicators: authority, delegator, demonstrator, facilitator, and hybrid. To ensure content validity, the questionnaire was evaluated by experts in mathematics education and research methodology, and a pilot test was conducted among non-participating BSEd–Mathematics students. Minor revisions were made based on feedback to improve clarity and phrasing. The pilot testing yielded a Cronbach's alpha coefficient of 0.70, indicating acceptable reliability and internal consistency. For the qualitative phase, the researcher developed an interview guide containing open-ended grand tour questions designed to elicit detailed insights into students' lived experiences and perceptions of their instructors' teaching styles. Sample questions included: "What are your remarkable and unlikely experience with your Instructor's teaching style in your entire stay in college?" "When giving feedback, which aspects of your teacher teaching style do you frequently identify for improvement?" and "What coping mechanism do you typically use to address and manage the challenges related to your teacher's teaching style?" These questions guided both the focus group discussions (FGDs) and in-depth interviews (IDIs). The qualitative instruments were validated by a panel of experts, and refinements were made following feedback from a pilot session. All instruments were personally administered by the researcher with assistance from the research adviser, ensuring accuracy in implementation and integrity in data collection.

Data Analysis

Both quantitative and qualitative data were analyzed separately and then combined to arrive at a comprehensive interpretation in line with the convergent parallel mixed-method design. Quantitatively, survey responses were initially checked for completeness and accuracy; incomplete or outlying values were subjected to standard data-cleaning procedures—gross incompleteness resulted in the removal of the response, while minor incompleteness was treated by mean substitution to preserve the consistency of the data. Validated data were then analyzed through descriptive and inferential statistics. First, descriptive statistics were calculated for the mean and standard deviation to establish the level and dispersion of all five teaching style indicators: authority, delegator, demonstrator, facilitator, and hybrid. Second, deeper insights were pursued through inferential analyses, including one-way ANOVA and t-tests, designed to determine significant differences in students' perceptions of teaching styles across year levels and other demographic profiles. These combined analyses gave further detail and comparison of how teaching styles vary among instructors. In the qualitative phase, transcripts from focus group discussions and in-depth interviews were analyzed using the thematic analysis framework of Miles et al., (2014). Analysis followed three systematic stages: initial coding to identify meaningful phrases or responses, pattern coding to cluster similar ideas, and developing overarching themes representing shared experiences and perceptions of students about teaching practices. Peer debriefing and member checking were conducted to enhance the credibility and trustworthiness of findings. Lastly, the findings from the two data sets were combined and compared for convergence, divergence, and complementarity to lead to a more holistic and validated understanding of how different teaching styles influence engagement in learning and student outcomes.

RESULTS

The Students' Profile

The data from Table 1 are very informative, giving insight into students' perceptions of KCAST mathematics instructors' teaching styles across different year levels. The grand mean score of 4.16 (high) reflects the students' perception that their instructors generally adopt good teaching strategies that accommodate students with different learning styles. Amongst the teaching styles, the hybrid style was rated the highest with a mean score of 4.30 (very high), indicating that the instructors frequently adopt multiple approaches, such as authority, demonstrator, and facilitator styles. Demonstrator and facilitator styles were rated very highly, with means of 4.28 and 4.20 (high), respectively, showing that demonstration, multimedia presentation of ideas, guided activities, and independent creativity are used frequently. Authority and delegator styles had relatively lower ratings, with means of 4.04 and 3.95 (high), indicating that the instructors are more structured in providing guidance while encouraging students to adopt student-led tasks and collaboration.

Table 1. Level of Teaching Style

Variables and Indicators	Mean	Description
A. *Authority*		
1. noticed that my instructor uses one-way presentation style during class discussions.	4.02	High
2. observed that my instructor conducts extra sessions so that students can acquire more information.	3.95	High
3. saw that my instructor asked the students to take down notes.	4.08	High
4. recognized that my instructor uses lengthy sessions during class discussions.	3.99	High
5. realized that my instructor distributes a copy of their lesson to the students.	4.18	High
Category Mean	**4.04**	**High**
B. Delegator		
1. noticed that my instructor uses lab activities to encourage active learning, interaction, participation, and collaboration among students.	3.70	High
2. observed that my instructor encourages us to write every day.	3.90	High
3. saw that my instructor gave the students tasks to write short stories, diaries, essays, and more.	3.82	High
4. recognized that my instructor observes the students while they perform tasks.	4.21	High
5. realized that my instructor sees themselves as a delegator inside the classroom.	4.11	High
Category Mean	**3.95**	**High**
C. Demonstrator		
1. noticed that my instructor demonstrates the class activity.	4.37	Very High
2. observed that my instructor uses multimedia presentations for the students.	4.32	Very High
3. see that my instructor utilizes my teaching expertise in delivering the lesson.	4.24	High
4. noticed that my instructor guides students in	4.24	High

their daily tasks..		
5. realized that my instructor demonstrates a cohesive teaching style for the entire subject I teach.	4.23	High
Category Mean	**4.28**	**Very High**
D. Facilitator		
1. noticed that my instructor recognizes me as a facilitator.	3.97	High
2. observed that my instructor encourages the students to ask questions regarding our topic.	4.26	Very High
3. see that my instructor consults others to resolve problems in order to ensure clear understanding and keep the students on track.	4.22	High
4. realized that my instructor encourages the students in activities to develop their special abilities.	4.27	Very High
5. observed that my instructor encourages independent creativity from the students.	4.29	Very High
Category Mean	**4.20**	**High**
E. Hybrid		
1. noticed that my instructor uses discussion as the primary teaching strategy in the entire subject he/she handles.	4.25	High
2. observed that my instructor does not bring personal problems into the classroom.	4.23	High
3. observed that my instructor gives their all to the profession.	4.23	High
4. noticed that my instructor is interested in students learning a lot from their lessons.	4.32	Very High
5. noticed that my instructor controls the class confidently.	4.47	Very High
Category Mean	**4.30**	**Very High**
Overall Mean	**4.16**	**High**

The findings highlight that KCAST mathematics instructors use flexible and adaptive teaching approaches depending on the context and learner needs. The strong use of the hybrid style indicates a predilection among students for a mix of structured, teacher-centered methods with interactive, student-centered strategies. This supports the calls of Yoshida et al. (2023) and Abbas and Hussain (2018) for adaptive teaching to realize deeper learning. Students' high ratings for authority signify respect for instructors' professional expertise and guidance, which is considered important for stimulating critical thinking and fostering independent learning, as emphasized by Brigstocke (2020). Similarly, the high scores for the delegator and facilitator styles reflect experiences of student autonomy, collaboration, and engagement, as suggested by Sim et al. (2022) and Gonzales (2023), respectively.

The research outcomes shed light on how mathematics teaching at KCAST is very successfully conducted. Most importantly, the hybrid teaching style shows how the combination of different teaching strategies, both traditional and digital, enables learning to be more adaptive and inclusive, as mentioned by Sołtysiak & Roberts (2024) and Wall & Sobel (2024). It allows students to be quite participative, understand better, and enables differentiating according to diverse learning preferences. In general, the results indicate that a blend of different teaching styles leads to effective and meaningful math teaching, which improves the learning experiences of students and fosters positive academic results.

The Lived Experience and Coping Mechanism of Teacher Education Students regarding their Teacher's Teaching Style

Table 3.1 Themes and Core Ideas on the Lived Experience and Coping Mechanism of Teacher Education Students Regarding Their Teacher's Teaching Style

There are two important themes which were generated based on the in-depth interviews and focus group discussions of the participants on the first research question. Before presenting the results from the interviews and discussion, the profiles of the participants for the qualitative data collection are presented in Table 3.1. The table presents the participants' profiles for the qualitative data, selected purposively based on the inclusion criteria, specifically that they should be BSEd Mathematics students at KCAST. Based on the table, the profiles are divided into participants' sex and year level.

Issue probed	Core ideas	Code/ categories	Essential themes	Theoretical supports
Adaptability to Diverse Teaching Styles	• Utilizing self-directed learning strategies and peer collaboration to overcome teaching style challenges. • Observing and assessing the teacher's approach to adapt effectively. • Enhancing teaching effectiveness through interactive methods and student-centered approaches. • Seeking alternative learning resources to understand lessons. • Using self-directed learning and peer support to overcome understanding challenges. • Relying on online resources, textbooks, and peer support for learning. • Utilizing online platforms and peer discussions for learning support. • •Using self-study	Adaptive Learning Strategies Alternative Learning Resources	Student-Led Learning Adaptations	Constructivist Learning Theory (Piaget & Vygotsky)

Impact of Teaching Styles on Student Learning and Engagement	and online research to compensate for ineffective teaching. • Applying real-life examples to enhance understanding and engagement in learning. • Reinforcing lessons through repetition and simplification enhances student understanding. • Using real-life applications makes learning abstract concepts more engaging and practical. • Using diverse teaching methods and clear explanations fosters an inclusive and effective learning environment. • Teachers should adapt diverse strategies to accommodate students' varying learning styles. • Effective teaching requires clarity, appropriate pacing, and diverse instructional methods. • Teachers should use differentiated instruction for inclusivity. • Effective teaching aligns with students' learning styles, while unprepared instruction hinders learning. • Mismatch between	Employing Teaching Strategies for Effective Learning	Optimizing Teaching Styles for Student Success	Sociocultural Theory (Vygotsky, 1978)

	teaching examples and assessments causes student confusion. • Lack of teacher guidance and feedback leads to student difficulties in understanding and assessments. • Engaging and interactive teaching enhances learning, while monotonous instruction hinders student interest. • Lack of guidance and feedback hinders learning. • Instructors should reflect on and assess their teaching effectiveness for continuous improvement. • Teachers should accept student feedback for improvement.	Barriers to Effective Teaching and Learning

Student-Led Learning Adaptations In the case of a teacher's teaching style in education, strategies and modifications which provide students with more responsibility for their own learning. Instead of teacher-directed instruction, students take a leading role in all manners of decision-making, exploration, and facilitating discussions or activities. It encourages independence, creativity, and problem-solving, allowing students to learn at their own pace and in ways that suit their interests and strengths. The teachers still support and offer guidance, but they act more as facilitators rather than direct instructors. Participants shared:

> *"To cope with challenges related to my teacher's teaching style, I take detailed notes, watch online tutorials, and discuss lessons with classmates. And then ang pagbuo sab og study groups dako kaayo ug tabang aron nga mas masabtan ang mga difficult topics."(*IDI-1*)*
>
> (To cope with challenges related to my teacher's teaching style, I take detailed notes, watch online tutorials, and discuss lessons with classmates. Additionally, forming study groups is a huge help in better understanding difficult topics.)
>
> *"In the case of adapting and adjusting to our teacher's teaching style, first namo gena buhat jus is maminaw lang mi sa iyaha and mah observe*

> *what are the pag treat sa amoa so in that way ma ssess namo if unsa treatment ni ma'am sa amoa or unsa ang iyang paagi sa among buhaton para maka adjust mi" (FGD-*1*)*
>
> (In the case of adapting and adjusting to our teacher's teaching style, the first thing we really do is listen to her and observe how she treats us or what her way of treating us is. That way we can assess what we need to do in order to adjust.)

Optimizing Teaching Styles for Student Success. Participants emphasized that their learning improved Optimizing Teaching Styles for Student Success. Participants underlined that their learning was optimized when teachers managed to adapt and refine their methods to suit diverse learning needs, abilities, and preferences of students. They reported that effective teaching involved the use of several strategies, such as explaining abstractions through real-life applications, repetition and simplification of what is complex, and interactive activities that allowed students to take part in the lesson. Participants stated:

> *"One of the most remarkable experiences I've had with my instructor's teaching style was when a professor used real-life applications to explain the abstract mathematical concepts. It made learning more engaging and practical." (*IDI-1)
>
> *"Ang teacher is kana ganing kanang ang concern sa teacher is kana ganing maka learn jud ang bata so one of those are kaning ay one of those is katong among Instructor nga iyaha jung gina balik balik jud ug tudlo ang mga topics whenever nga naay dili ka sabot or dili jud mi ka sabot so iyang gina balik balik ang topic and iyaha pong gina pa simplify ang mga terminologies ang mga examples for us to fully grasp the lesson." (*FGD-1*)*
>
> (The teacher is someone who genuinely cares about the students' learning. One example is our instructor who repeatedly goes over the topics whenever someone does not understand or when we struggle to comprehend. The teacher repeats the lesson and also simplifies the terminologies and examples to help us fully grasp the material.)

According to these findings, the teaching style adopted by the instructors greatly shapes students' learning experiences and academic success. Students said that if teachers are able to adapt teaching styles to match individual learning styles, it enhances participation, conceptualization, and motivation. On the other hand, instructors who rely on one specific teaching style or method are often incapable of addressing students' needs, leading to less participation, confusion, and inability to retain any information. The strategies that participants identified as producing this feeling of connection included differentiated instruction, interactive discussions, and the use of real-world applications.

These findings are supported by Vygotsky's Sociocultural Theory of 1978, which states that knowledge is socially constructed through interaction with more knowledgeable others and students perform well when they are guided through their zone of proximal development. The results also relate to the notion of student agency as suggested by Constructivist Learning Theory (Piaget & Vygotsky), where learners

engage themselves actively with peers, explore independently, and adapt learning techniques to become critical thinkers and independent. Again, the work of Septiani et al. (2024) and Mudzakkir and Darmawan (2024) emphasizes the following: the more closely teaching styles are tailored to accommodate the preferred styles of students (visual, auditory, or kinesthetic), the greater the understanding, retention, and motivation; conversely, the more inconsistent or nonadaptive teaching that occurs, the more negative the impact on academic growth. Overall, the study emphasizes that flexible, student-centered, and responsive teaching approaches are necessary to foster qualitative learning experiences, acquire lifelong learning competencies, and guarantee maximum academic achievement among students in teacher education.

As summarized in Table 3.2, teachers' teaching styles significantly affect the engagement of students and learning outcomes. Specifically, the study identified four major teaching styles: authority, delegator, facilitator, and hybrid, which were validated across both the quantitative and qualitative phases of the research. These findings suggest that congruence between instructional approaches and the varied learning needs of students is increasingly important in encouraging learners to be more receptive to understanding concepts. This is supported by Tulang et al. (2023), who stated that students respond better when teachers employ multiple strategies to accommodate different students' learning preferences. In the same way, Ligan and Tacadena (2022) stressed how interactive, discussion-based, and self-directed learning methods promote student ownership, cooperation, and understanding. These findings are further supported by the integration of the quantitative and qualitative results of this study. It showed that a balance between structured guidance and interactive learning methods was deemed essential for effective teaching.

Moreover, studies highlight how teaching styles are impactful in developing 21st-century learning and innovation skills. The study established that using a variety of teaching styles significantly relates to students' creativity, collaboration, and critical thinking. That agrees with the findings of the joined display, which shows that authority, facilitator, and hybrid styles are effective teaching styles that greatly influence student outcomes. Besides, flexible teaching methods allow for autonomy and are thus vital to best practice in maximizing learning. Ligan and Tacadena (2022) further suggest that teaching approaches should be flexible and allow students to practice essential skills necessary for success in the 21st century. In sum, these texts imply that educators should hold a 'fluid' teaching style, which balances structure and autonomy to maximize engagement and skill building.

Table 3.2. Joint Display of Salient Quantitative and Qualitative Findings

Aspect or focal point	Quantitative findings	Qualitative findings	Nature of data integration	Axiological implication
Teachers' Teaching Style	Also on Delegator, Item 1 - noticed that my instructor uses lab activities to encourage active learning, interaction, participation, and collaboration among students. (M=3.70)	In the same table, on the lived experience and coping mechanism of teacher education students regarding their	Merging-converging	The high rating for delegator indicates that fosters creativity and independence by promoting self-expression. Also, it develops collaboration and problem-solving skills through interactive activities.

	which its rated as high.	teacher's teaching style specifically in the issue probed, *Impact of Teaching Styles on Student Learning and Engagement* specifically in item 4 *Using diverse teaching methods and clear explanations fosters an inclusive and effective learning environment*		Encourages reflective and experiential learning.
	In the same table, in the indicator Facilitator specifically item number item 3- see that my instructor consults others to resolve problems in order to ensure clear understanding and keep the students on track. (M=4.22) which its rated as high. Also, in item 5- observed that my instructor encourages independent creativity from the students. (M=4.29) which rated as high.	In table 3.1 the lived experience and coping mechanism of teacher education students regarding their teacher's teaching style specifically in the core idea 5- *Teachers should adapt diverse strategies to accommodate students' varying learning styles.*	Merging-converging	The high rating for facilitator indicates that it promotes student-centered learning, fostering autonomy and adaptability. Encourages critical thinking and creativity through interactive discussions. Demonstrates openness to collaboration by seeking input from others.

	In the same table specifically in the indicator of Hybrid specifically item number 1- noticed that my instructor uses discussion as the primary teaching strategy in the entire subject he/she handles.. (M=4.25) which its rated as high.	In table 3.1 the lived experience and coping mechanism of teacher education students regarding their teacher's teaching style specifically in the core idea 6 under in the theme Impact of Teaching Styles on Student Learning and Engagement which stated that *effective teaching requires clarity, appropriate pacing, and diverse instructional methods.*	Merging-diverging	The high rating of discussion-based teaching strategies highlights the perceived value of interactive learning, yet students' lived experiences emphasize the need for instructional variety. This suggests that while discussion is effective, a balance of diverse teaching methods is essential to address varying learning preferences and maximize engagement.

Intervention Scheme Bases on the Findings of the Study

Title of the Intervention: Enhancing Student Engagement and Real-World Relevance Through Interactive and Personalized Learning Strategies

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Rationale:

Since the findings revealed that struggles, challenges and problems were experienced by the students, an intervention scheme was being created in accordance to the needed activities which may provide solutions to those issues. The following were three issues identified: lack of engaging and interactive teaching methods, limited practical application and real-world relevance, lack of personalized learning or Support. Along with these issues are the corresponding issue, objectives, activities, person involved, and time elements. Furthermore, the scheme outlines the specific actions to be taken when students encounter challenges with their teacher's teaching style. The particular demands and temperament of the concerned teacher should be taken into consideration when designing this activity. Additionally, the plan may recommend or mandate that teachers participate in the designated activities where they are most likely to encounter difficulties that could affect their own learning as well as that of the children.

Sources of Funds	Schools Supplies from Department Fund	Department allocation	Internal Department support	Own contribution, free online resources
Estimated Cost	₱300	₱250	₱500	₱100
Expected Outcomes	More active classroom engagements	Instructors gain insight for better teaching style alignment	Improved Understanding Through peer-adapted lessons	Enhance of comprehension of abstract topic
Target Involved	All math Student	KCAST math Faculty	BSEd Math Students	All Math Students
Person involved	Math Instructors	Instructors , Research Committee	All Math Instructors	Math Instructors
Time Frame	Weekly	Monthly	Every 2 Weeks	Ongoing (weekly)
Resources Needed	Recycled manila paper, markers, printed guides	Printed forms envelop box, pens	Whiteboard markers, shared photocopies	Printed Guide, Free Internet Articles
Mode	Classroom-based	Faculty-led activity	Department Sharing	Regular Classroom Implementation
Strategies/Activities	-Group discussions -Use of printed charts/visuals	-Suggestion box system -Monthly feedback summary review	-Peer Sharing Session of Best Practices -Class Storytelling of Activities	-Conduct weekly real-world math connection -Peer-sharing of analogies
Content	Peer discussion and low-cost visual aids	Feedback collection and self-reflection	Use of Shared Teaching Materials and Strategies	Use of analogies in real-life scenarios
Objective	To increase participation using minimal cost	To enhance methods through peer & student feedback	To promote flexible teaching using shared materials	To improve retention using Alternative Teaching Approach

Problems	Minimal engagement due to limited interactive activities	Lack of feedback mechanism on teaching style	Difficulty adapting to different student learning preferences	Low retention

CONCLUSION

This study examined the relationship between instructors' teaching styles and student engagement and learning outcomes using a mixed-methods approach. The integration of quantitative and qualitative findings revealed a strong alignment between numerical data and participant narratives, enhancing the credibility of the study.

The findings indicated that all five primary teaching styles, namely authority, delegator, demonstrator, facilitator, and hybrid, were generally rated high by students, showing that learners respond positively when instructional methods are varied and responsive to their needs. Authority and demonstrator approaches provided clear guidance and structured learning, while delegator, facilitator, and hybrid styles promoted active participation, creativity, and independence. The results also revealed that collaborative and socially interactive learning positively influenced higher-order thinking skills and overall satisfaction, consistent with the principles of Vygotsky's social constructivism.

Qualitative findings further elaborated on the experiences of students and instructors, highlighting themes such as the value of balancing teacher-centered and student-centered approaches, fostering collaboration, encouraging autonomy, and providing practical, real-world learning opportunities. Participants emphasized the importance of flexible and adaptable teaching, interactive activities, personalized academic support, and the use of technology to enhance engagement and accessibility. They also stressed that clear communication, structured feedback, and inclusive teaching strategies strengthen teacher-student relationships and improve learning outcomes.

The integration of both quantitative and qualitative results demonstrated that engaging teaching practices, which combine guidance with opportunities for independence and collaboration, significantly enhance students' learning experiences. These insights suggest that teacher preparation programs should focus on developing instructors' ability to implement flexible, student-centered, and varied pedagogical approaches. Such strategies not only improve academic performance but also foster creativity, critical thinking, and positive learning attitudes, preparing students to succeed in dynamic 21st-century learning environments.

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