Investigating Students' Lived Experiences in Mathematics Classroom Activities

Matthew E. Cañeda, Legen P. Mata, Robemeh W. Bedrijo

Agusan Del Sur State College of Agriculture and Technology

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ABSTRACT

This study investigates the lived experiences of Bachelor of Secondary Education (BSEd) Mathematics students at Agusan del Sur State College of Agriculture and Technology (ASSCAT) within mathematics classroom activities during the 2023-2024 academic year. Adopting a qualitative phenomenological approach, the research delves into students' emotional, behavioral, and cognitive responses to classroom activities, such as group reporting, oral recitations, and problem-solving. Through semi-structured in-depth interviews and focus group discussions, three key themes emerged: (1) emotional responses marked by anxiety and insecurity in public tasks, (2) coping strategies involving peer support, self-directed learning, and external resources, and (3) perceptions of classroom activities, emphasizing the importance of teacher guidance and collaborative work. The findings suggest that while group activities promote understanding and collaboration, students frequently experience anxiety, highlighting a need for diverse teaching methods and greater instructor support. These insights underscore the value of fostering emotional well-being and collaborative learning, with recommendations to integrate varied instructional strategies, ultimately enriching mathematics education and supporting student engagement and success.

Keywords: Students' experiences, Mathematics classroom activities, Phenomenology, ABC Model, Mathematics Education

INTRODUCTION

Mathematics education serves as a cornerstone for developing critical thinking and analytical skills essential for STEM disciplines (Li & Schoenfeld, 2019). However, many students experience significant challenges, including anxiety and disengagement, when tackling complex mathematical concepts (Ashcraft & Krause, 2007). These challenges are particularly critical, as their attitudes and experiences in mathematics classrooms can shape their future teaching approaches (Roche et al., 2021). While previous studies have extensively discussed the cognitive and performance aspects of mathematics learning (Turner et al., 2002), there is limited qualitative research on students' lived experiences that captures the emotional, behavioral, and cognitive dimensions holistically, particularly in the context of classroom interactions and teaching activities. This gap points to a need for a deeper understanding of how mathematics classroom activities influence students' engagement and coping mechanisms.

Research has shown that anxiety in mathematics, often triggered by high-stakes classroom tasks, such as oral recitations and public problem-solving, can lead to avoidance behaviors and negatively impact performance (Ashcraft, 2002; Zhang et al., 2019). For instance, public tasks may provoke nervousness and insecurity, affecting students' willingness to participate and ultimately hindering their learning and skill development (Pekrun, 2006). Coping mechanisms, such as seeking support from peers and using resources like online tutorials, have been identified as common strategies for managing these challenges (Schunk & Greene, 2018). However, an over-reliance on such mechanisms may prevent students from developing independent problem-solving skills and resilience (Dweck, 2006). Thus, there is a need for more comprehensive research that examines how students navigate the demands of mathematics activities, balance reliance on support with self-directed efforts, and interpret the role of teachers in facilitating their learning.

This study addresses these gaps by exploring the emotional, cognitive, and behavioral responses of BSEd Mathematics students to classroom activities. Through a phenomenological approach, it aims to capture the depth and complexity of students' lived experiences, providing insights into how classroom dynamics and instructional methods impact their learning and development as future educators. This research has significant implications for mathematics education, as it underscores the importance of fostering supportive, inclusive classroom environments that mitigate anxiety and enhance engagement through diverse instructional strategies. By addressing students' needs holistically, educators can better equip future teachers with the skills and confidence necessary to approach mathematics teaching effectively, ultimately contributing to improved educational outcomes in mathematics education.

Furthermore, a prevalent issue in mathematics education is the difficulty students face in comprehending abstract or complex mathematical concepts (Rasmuin, 2022; Cañeda et al., 2024b). Concepts such as calculus, algebraic structures, and multi-dimensional analysis can be challenging, especially when the instructional approach is traditional and lacks interactive or contextualized learning opportunities (Cañeda et al., 2024a). Studies indicate that conventional instructional methods, such as lecture-based approaches, often fall short of engaging students meaningfully, limiting their ability to retain and apply mathematical knowledge effectively (Vansdadiya et al., 2023). This issue is compounded by the highly cumulative nature of mathematics, where understanding advanced topics is contingent upon mastery of foundational concepts (Liu et al., 2024).

Mathematics anxiety is another significant factor impacting students' experiences in mathematics classrooms. Mathematics anxiety—characterized by feelings of tension, apprehension, or fear when engaging with mathematical tasks—can be debilitating, affecting not only students' performance on tests but also their participation in classroom activities, such as problem-solving exercises and oral recitations (Zhang et al., 2019). This anxiety can lead to avoidance behaviors, decreased participation, and, ultimately, lower academic outcomes. Furthermore, the persistent stress associated with mathematics can create a negative feedback loop, where past difficulties increase anxiety, which in turn impedes future learning and performance (Atoyebi et al., 2023).

Additionally, traditional classroom structures may fail to engage students who struggle with maintaining focus in an environment that primarily emphasizes direct instruction rather than active learning or collaboration (Dubinsky & Hamid, 2024). The research underscores that interactive and student-centered teaching strategies, such as collaborative problem-solving, discussion-based learning, and technology-enhanced instruction, can help students become more actively engaged, reducing feelings of alienation and bolstering confidence (Garrett, 2008). Consequently, students' difficulties with engagement in mathematics are often a result of instructional designs that do not align with modern pedagogical practices known to support engagement, motivation, and comprehension (Alrajeh & Shindel, 2020).

These challenges underscore the need for educators and researchers to better understand students' lived experiences within mathematics classrooms. Examining how students perceive, experience, and cope with the demands of mathematics instruction is crucial for developing instructional strategies that address both the cognitive and emotional dimensions of learning (Lepore, 2024). By fostering a learning environment that supports both comprehension and engagement, educators can create a more inclusive and effective approach to teaching mathematics that empowers students to overcome these common barriers.

Research on mathematics education has highlighted various approaches that aim to address these challenges, including group activities, collaborative learning, and self-directed study. Studies by Roche et al. (2021) and Siller and Ahmad (2024) emphasize the benefits of group activities, such as peer reporting and collaborative problem-solving, which can help students develop a deeper understanding of mathematical concepts through discussion and shared learning experiences. These activities are grounded in Vygotsky's (1978) Social Constructivist Theory, which suggests that students learn more effectively when interacting with peers within their Zone of Proximal Development (ZPD) (McLeod, 2024). However, other studies, such as those by Brandt (2020), caution that group activities may be less effective if not properly facilitated by instructors, leading to potential misconceptions when students rely on each other without sufficient guidance.

Self-directed learning is another strategy that has gained attention as a means of helping students overcome challenges in Mathematics. Zimmerman and Schunk (2011) argue that self-regulated learners—those who actively set goals, monitor their progress, and seek out resources—tend to achieve higher levels of academic success. This approach encourages students to take ownership of their learning, especially in subjects that require persistent practice, such as mathematics. However, as noted by Douglass and Morris (2014), not all students are equally equipped to manage self-directed learning, particularly those who lack intrinsic motivation or struggle with the discipline required for independent study. The current study aims to investigate how students balance self-directed efforts with the need for peer and instructor support in mathematics classrooms.

Additionally, coping with the pressures of mathematics learning often involves seeking support from peers and managing emotional responses to academic stress (Stanisławski, 2019). According to Lazarus and Folkman’s (1984) Stress and Coping Theory, students employ both problem-focused and emotion-focused strategies to deal with academic challenges. For example, students may engage in problem-solving with classmates or use emotion-focused strategies like seeking reassurance from friends during stressful moments. While these coping mechanisms can provide immediate relief (Dunkley et al., 2000), studies such as those by Dunkley et al. (2012) suggest that an over-reliance on social support may inhibit the development of independent problem-solving skills. This study seeks to explore how students navigate these coping mechanisms, particularly in balancing reliance on peers with building their resilience in mathematics learning.

At ASSCAT, this study marked a pioneering effort within the College of Teacher Education (CTE), specifically targeting the BSEd program with a focus on Mathematics. The primary aim was to delve into the lived experiences of students within Mathematics classroom activities. By exploring these experiences, the study sought to gain a deeper understanding of the challenges college students encounter in Mathematics, ultimately offering insights and recommendations to enhance their learning journey. This research contributes to the broader educational field by examining the day-to-day realities students face in math classes, pinpointing which activities either support or hinder their learning progress. Through this approach, the study aims to highlight ways educational institutions can more effectively support students as they navigate the demands of Mathematics. By identifying impactful strategies and addressing current shortcomings, the research aspires to enhance teaching practices, fostering a more inclusive and supportive environment for all students engaged in Mathematics education.

Specifically, this study wanted to address the following research questions:

1. What were the responses of BSEd Mathematics students during classroom activities?
2. What were students’ coping strategies for managing challenges during classroom activities?
3. What were student's perceptions of various classroom activities?

METHODOLOGY

Research Design

This study utilizes a qualitative approach, specifically a phenomenological design, to explore the lived experiences of students in Mathematics classroom activities. A phenomenological design is appropriate when the goal is to understand the essence of participants' experiences regarding a particular phenomenon (Creswell & Poth, 2018). This design allows for an in-depth exploration of how students experience and cope with challenges in their Mathematics classes, offering insights into their emotional responses and the impact on their learning process.

Participants

In this phenomenological study, 14 participants were involved, with seven selected for IDI and seven for FGD. Tables 1 and 2 provide the profiles of those involved in the IDI and FGD, respectively, including their pseudonyms, courses, age, sex, year level, and study location. The participants were BSEd Mathematics students from ASSCAT. A purposive sampling method was used to select individuals who had firsthand experience with Mathematics classroom activities such as group reporting and oral recitation. These students encountered various teaching strategies, including group activities, oral recitations, and problem-solving exercises, which were explored during the IDIs and FGDs.

Table 1. Profile of Research Participants of the Study Involved in IDI

No	Pseudonym of the Participants	Course	Age	Sex	Year Level	Location
1	Chou	BSEd-Math	24	M	4	ASSCAT
2	Layla	BSEd-Math	20	F	1	ASSCAT
3	Miya	BSEd-Math	22	F	3	ASSCAT
4	Saber	BSEd-Math	20	M	2	ASSCAT
5	Gusion	BSEd-Math	21	M	2	ASSCAT
6	Tigreal	BSEd-Math	22	M	3	ASSCAT
7	Belerick	BSEd-Math	22	M	3	ASSCAT

Table 2. Profile of Research Participants of the Study Involved in FGD

No	Pseudonym of the Participants	Course	Age	Sex	Year Level	Location
1	Fanny	BSEd-Math	19	F	1	ASSCAT
2	Thamus	BSEd-Math	21	M	2	ASSCAT
3	Johnson	BSEd-Math	23	M	4	ASSCAT
4	Lancelot	BSEd-Math	21	M	2	ASSCAT
5	Jaw Head	BSEd-Math	30	M	1	ASSCAT
6	Estes	BSEd-Math	22	M	3	ASSCAT
7	Khufra	BSEd-Math	22	M	3	ASSCAT

Data Collection

To collect relevant data for the study, the researcher followed a systematic approach. First, an interview guide was developed and validated by expert examiners. Suggestions and corrections were carefully considered and incorporated into the final version of the questionnaire. Then, permission and approval to conduct the in-depth interviews and focus group discussions were obtained from the dean.

Each participant was informed that the interview was audio recorded. Questions were given in English however they could ask questions or clarification if they were in doubt about their understanding or idea about the questions. They can also answer in the vernacular to better facilitate the easy flow of ideas and so that they can express themselves well.

During the data collection phase, each interview began with an introduction explaining the research purpose, assurances of confidentiality, and details on participants' rights. Interview sessions lasted approximately 30 to 60 minutes, accommodating participants' schedules. Conducted face-to-face on the school campus, the in-depth interviews involved seven student participants, scheduled during breaks or after classes. Each session, typically completed in a single meeting per participant, aimed to identify recurring themes in students' lived

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experiences. Following the individual interviews, a focus group discussion (FGD) was held with a different group of seven students to collectively explore their insights. Consistent questions were used across both the individual interviews and the FGD to allow for comparison, with a particular emphasis on the student's experiences during classroom activities.

Data Analysis

Data collected from the IDIs and FGDs were transcribed into the vernacular, and translated into English. Subsequently, coded and organized into themes. This process involved multiple rounds of reading and coding to ensure that the emerging themes were deeply explored and that the key codes were refined iteratively as the analysis progressed. Furthermore, the study employed Colaizzi’s (1978) Model in analyzing the students’ experiences in Mathematics classroom activities, providing a structured and comprehensive examination of their lived experiences. The steps of Colaizzi’s Model were systematically applied, allowing for a detailed understanding of the data shown below.

Familiarization: The researchers started by thoroughly reading and re-reading the transcripts of interviews and focus group discussions with students. This process allows for immersion into the participants' experiences with classroom activities. By engaging deeply with the data, the researchers gained a comprehensive understanding of the students’ emotional, cognitive, and behavioral responses to these activities.

Extracting Significant Statements: The next step involved identifying significant statements from the data. These were key phrases or sentences that were directly related to the students’ experiences in Mathematics classroom activities. For instance, phrases expressing emotions such as "I feel anxious during problem-solving" or "I enjoy collaborative exercises in class" were marked. These significant statements were crucial because they provided direct insights into the participants’ lived experiences.

Formulating Meanings: Once the researchers identified key statements from the students, they began exploring the deeper meanings behind them. For instance, a student's comment about feeling anxious during problem-solving could hint at concerns about academic pressure or self-confidence. This step moves beyond the words themselves, seeking to understand the larger issues students face in their math experiences. Through careful interpretation, the researchers aimed to ensure that these insights genuinely resonated with the students' perspectives, capturing what each statement revealed about their unique challenges and emotions.

Organizing into Themes: The formulated meanings were grouped into themes that reflect the broader aspects of students’ experiences. These themes help to structure the data and reveal patterns in how students experience different classroom activities.

Developing a Detailed Description: Using the themes, the researcher developed a detailed, rich description of the students' overall experiences in mathematics classroom activities. This step involved weaving together the various insights into a cohesive narrative that captures the essence of how students feel, think, and act during math-related tasks. These descriptions illustrated both the challenges and the positive aspects of engaging in activities like group reporting, oral recitations, and collaborative problem-solving.

Producing a Fundamental Structure: The detailed description was condensed into a more concise, fundamental structure. This structure represents the essence of the students' experiences in Mathematics classroom activities. For example, "Students' engagement and success in mathematics are influenced by emotional support, collaborative learning, and an inclusive classroom environment."

Validation by Participants: Finally, to ensure the accuracy of the findings, the researcher will return the data to the participants for validation (also known as member checking). The students will review the researcher’s interpretations and confirm whether the findings accurately reflect their experiences. No necessary revisions were made by the participants noting the results were closely related to their perspectives.

The approach not only captured the nuanced emotional, cognitive, and behavioral dimensions of students' engagement in classroom activities but also provided a structured way of analyzing and validating these experiences. Colaizzi's (1978) Model guarantees that the research remains grounded in the participants' own words and perspectives, offering a detailed and trustworthy account of their experiences in mathematics learning.

In addition, the ABC (affective, behavioral, and cognitive) model or the Tripartite model was utilized to enrich the discussions or elaborations relative to the themes. The ABC or Tripartite Model, widely used in psychology and education, explains attitudes by breaking them down into three key components: Affective (A), Behavioral (B), and Cognitive (C). Developed in the mid-20th century, this model provides a framework for understanding attitudes and responses within a context, allowing researchers to analyze how individuals emotionally respond, behave, and think regarding a specific subject (Katz, 1960; Breckler, 1984).

Trustworthiness

In the study examining students' experiences in mathematics classroom activities, trustworthiness was rigorously established to ensure that findings accurately and authentically represented participants' perspectives. The research adhered to key principles of trustworthiness, including credibility, transferability, dependability, and confirmability, each of which was prioritized to maintain the study's rigor and reliability (Lincoln & Guba, 1985).

Credibility was achieved through triangulation and member checking, which bolstered the authenticity of the findings. Multiple data collection methods, including in-depth interviews, classroom observations, and reflective journals, were employed to triangulate the data, allowing for a more comprehensive understanding of students' experiences in mathematics classrooms (Patton, 2015). Additionally, member checking was conducted by inviting participants to review and validate preliminary interpretations of the data. This process ensured that the findings accurately captured participants' experiences and perspectives, reducing the risk of researcher bias in interpretation (McKim, 2023).

Transferability was enhanced by providing a thick description of the study's context, participants, and procedures. Detailed descriptions of the classroom environment, instructional methods, and student demographics were included to help readers understand the specific context in which the study was conducted. This rich contextual information enables other researchers and educators to assess the relevance of the findings to their settings, making it possible to apply insights from the study to similar educational contexts (Younas et al., 2023).

To ensure dependability, an audit trail was meticulously maintained throughout the research process, documenting each step of data collection, analysis, and interpretation. This audit trail provided a transparent account of the decisions made during the study, allowing others to understand and, if necessary, replicate the research process (Carcary, 2020). Regular peer debriefing sessions were also conducted, wherein colleagues reviewed the research methods and findings to further validate the study's consistency and reduce potential biases. This approach enhanced dependability by ensuring that the research process was both logical and well-documented (Ahmed, 2024).

In this study on students' experiences in mathematics classroom activities, confirmability is an essential aspect of ensuring that findings truly reflect participants' perspectives rather than researcher bias. Confirmability in qualitative research represents the objectivity or neutrality of the findings, aiming to capture participants' experiences accurately (Lincoln & Guba, 1985). To enhance confirmability, audio-recorded interviews are used, allowing researchers to capture students' exact words, tone, and emphasis, which minimizes interpretative bias during transcription and analysis (Ravitch & Carl, 2016). By creating a verbatim account, these recordings provide a clear evidence trail that an independent reviewer can verify, supporting the authenticity of the responses (Noble & Smith, 2015).

In addition to recordings, the study includes reflective journaling throughout the data collection process. By documenting personal reflections or potential biases, the researcher can separate participants' views from their own interpretations, maintaining objectivity (Shenton, 2004). This approach helps distinguish the authentic student experiences shared in mathematics activities from any external interpretations. Furthermore, member checking is incorporated, where participants review their interview transcripts or summaries. This process allows students to confirm or clarify their statements, ensuring their experiences are represented accurately. Member checking thus strengthens the confirmability and trustworthiness of the findings by directly involving participants in verifying the interpretation of their responses (Birt et al., 2016). Peer debriefing was also incorporated to allow external reviewers to scrutinize the findings, thereby adding an additional layer of objectivity to the study. These practices reinforced confirmability, as the findings reflected participants' voices and experiences without undue researcher influence (Nowell et al., 2017).

Ethical Considerations

In conducting the study on college students' experiences in mathematics classroom activities, ethical considerations were rigorously upheld to ensure the integrity of the research and safeguard participants' rights and well-being. Core ethical principles such as informed consent, confidentiality, voluntary participation, and minimizing potential harm were prioritized to establish a trustworthy and respectful research environment (Creswell & Poth, 2018).

Informed consent was obtained from all participants, ensuring that they were thoroughly briefed on the study's purpose, procedures, and any potential risks and benefits. In this study all participants were eighteen years old and above, they were explained about the study's details and provided with a written consent form, which each participant reviewed and signed. This approach ensured that participants understood their role and willingly chose to engage with the study without any ambiguity or pressure. By securing informed consent, the study upheld ethical standards and encouraged participants to provide candid insights into their experiences (Creswell, 2014).

Strict measures were taken to protect the confidentiality and anonymity of participants throughout the research process. Each participant was assigned a pseudonym, and any identifying information was removed from transcripts and reports to prevent tracing responses back to individuals (Kang, & Hwang, 2023). Protecting participants' identities was especially pertinent due to the personal nature of discussing experiences in mathematics classrooms, which can sometimes involve sensitive feelings around performance and anxiety. Data was securely stored and accessed only by the research team, ensuring participants' privacy was rigorously maintained from data collection through analysis (Cohen et al., 2018).

Participation in the study was completely voluntary, and all participants were informed of their right to withdraw at any point without any academic or personal repercussions. The research team emphasized that there was no obligation to participate, and withdrawing from the study would have no negative consequences on their academic standing or relationships with faculty. This emphasis on voluntariness was particularly important in an educational setting, as students often interact with faculty and institutional figures who could unintentionally influence their decision to participate (Babbie, 2020). By clearly communicating this right, the study ensured that participants felt free to share their genuine experiences.

The study design incorporated strategies to minimize any potential emotional or psychological harm to participants. Recognizing that reflections on academic challenges, such as those in mathematics, might evoke frustration or anxiety, the research team fostered a supportive and non-judgmental environment during interviews and discussions (Hammersley & Traianou, 2012). Neutral and empathetic language was used in both the interview questions and during interactions with participants, creating an atmosphere that encouraged open expression without fear of judgment. Furthermore, researchers remained mindful of participants' emotional responses and were prepared to offer resources or referrals if anyone felt discomfort or distress (Creswell & Poth, 2018).

RESULT AND DISCUSSION

Based on the thematic analysis of the IDI and FGD, shown in Table 3 is the breakdown of the main theme, subthemes, and codes.

Table 3

Main Theme: Student Experiences in Mathematics Classroom Activities
Subtheme 1: Emotional Responses to Classroom Activities
Code 1: Nervousness during Reporting and Recitations
Code 2: Anxiety Due to Lack of Preparedness
Code 3: Insecurity About Performance in Oral Recitation
Subtheme 2: Strategies for Coping with Academic Challenges
Code 1: Seeking Help from Peers
Code 2: Studying and Practicing
Code 3: Using Resources Like YouTube and Classmates
Subtheme 3: Student Perceptions of Classroom Activities
Code 1: Value of Group Activities
Code 2: Importance of Teacher's Role in Clarifying Concepts

Experiences in Mathematics Classroom Activities

Students' experiences in mathematics classroom activities, as highlighted in the interviews and discussions, show a mix of challenges and learning opportunities. Group activities, such as reporting and oral recitations, are common, with students frequently taking on roles like solving problems, presenting ideas, or managing technical aspects like creating PowerPoint presentations. Many students feel a sense of pressure and nervousness, particularly when they are asked to report or solve problems on the spot. They cope by seeking help from classmates, practicing problem-solving, and using online resources. Despite the anxiety, students also appreciate the learning gains from these activities, especially how group work and reporting help them understand topics better and enhance their skills as future teachers. However, they express a desire for more instructor guidance during activities and a balance between reporting and other interactive teaching strategies.

Emotional Responses to Classroom Activities

In both the In-Depth Interviews (IDI) and Focus Group Discussions (FGD), students expressed a range of emotional responses to mathematics classroom activities, particularly highlighting feelings of nervousness and insecurity. Chou (IDI_1) shared that on-the-spot reporting without prior preparation made the experience "very nerve-wracking." Similarly, Layla (IDI_2) simply stated, "It's really nerve-wracking," while Miya (IDI_3) admitted to feeling nervous, especially when unsure of her answers, opting to stay quiet when in doubt. Belerick (IDI_7) also highlighted the anxiety caused by randomly being chosen to present, expressing nervousness when called upon. Saber (IDI_4) mentioned feeling compelled to participate even when lacking understanding, adding to the stress of classroom activities.

In the FGDs, Fanny (FGD_1) shared that oral recitations could damage her self-confidence, especially when she was suddenly asked a question and could not answer due to nervousness. Johnson (FGD_3) echoed this sentiment, explaining how oral recitations negatively impacted his confidence, making him feel more anxious during activities. Lancelot (FGD_4) noted that he preferred listening to others' reports, as it made him less nervous and helped him learn more. Lastly, Khufra (FGD_7) revealed feeling insecure when unable to answer questions during oral recitations. These emotional responses highlight the common challenges students face in handling classroom activities, with anxiety and self-doubt emerging as significant factors affecting their experiences.

This subtheme captures the emotional reactions students have during mathematics classroom activities, especially those that involve public participation. Using the ABC (Affective, Behavioral, Cognitive) model or the Tripartite Model of Attitudes, we can understand these emotional responses in three dimensions: how students feel (Affective), how they behave (Behavioral), and what they think (Cognitive). The following sections will elaborate on this with a focus on nervousness, anxiety due to lack of preparedness, and insecurity during oral recitations.

Nervousness During Reporting and Recitations

Nervousness is a key emotional response to public tasks like reporting and recitations in the Mathematics classroom. As Chou mentioned, "It's very nerve-wracking... sometimes there's on-the-spot reporting, and I don't have any prior research or idea about the topic". The emotional response of nervousness stems from fear of failure and social evaluation by both teachers and peers. The Self-Efficacy Theory (Bandura, 1997) proposes that students who lack confidence in their abilities experience higher levels of nervousness, especially in situations requiring them to perform in front of others.

Nervousness often leads to observable behaviors such as hesitation in volunteering for tasks, reluctance to speak up during recitations, or stammering while presenting answers. These behaviors are driven by the fear of making mistakes or appearing less knowledgeable in front of peers, which can lead to avoidance strategies (Raja, 2017). Students might also engage in self-protective behaviors, such as rehearsing responses mentally to prevent failure during these high-pressure moments.

Cognitively, students interpret reporting and recitation tasks as threatening due to the high stakes involved. Layla described this experience as "really nerve-wracking... Solving problems is difficult because I might be wrong or sometimes, I don't get the answer immediately". This reflects a cognitive belief that failure in these tasks would lead to negative evaluations from peers and teachers. Achievement Goal Theory, developed by Elliot and McGregor (2001), proposes that students with performance-avoidance goals often perceive classroom challenges, such as oral recitations, more as risks of failure than as chances to learn, leading to increased cognitive anxiety. This theory categorizes goals into performance-approach, performance-avoidance, mastery-approach, and mastery-avoidance, each influencing students' attitudes and behaviors in academic settings. Specifically, performance-avoidance goals can cause students to shy away from activities where they feel their competence might be questioned, contributing to a heightened fear of failure and anxiety (Elliot & McGregor, 2001; Huang, 2011).

Anxiety Due to Lack of Preparedness

Anxiety, particularly due to lack of preparedness, plays a major role in students' emotional responses to classroom activities. Chou expressed this feeling by stating, "When the topic is difficult, it can reach a point where I really feel nervous". Students who feel unprepared experience heightened anxiety, fearing they will not be able to perform well or answer questions correctly. This emotional reaction is often exacerbated in mathematics, where the pressure to be accurate is high (Ashcraft, 2002; Turner et al., 2002).

Behaviorally, anxiety due to unpreparedness manifests in avoidance behaviors such as avoiding eye contact with the teacher, avoiding volunteering, or giving minimal responses when called upon. As Lancelot described, "When the instructor suddenly asks a question during oral recitation, I get nervous". These avoidance behaviors are protective mechanisms that students use to minimize their exposure to potential failure or embarrassment in front of the class.

Behaviorally, anxiety stemming from feeling unprepared often leads to avoidance behaviors, including avoiding eye contact with the teacher, refraining from volunteering, or providing minimal responses when called upon. These behaviors serve as protective strategies to reduce exposure to potential failure or embarrassment in front of peers (Turner et al., 2002). As one student, Lancelot, shared, "When the instructor suddenly asks a question during oral recitation, I get nervous." Such responses illustrate the tendency for anxious students to adopt avoidance behaviors as a way to manage anxiety in high-stakes classroom settings.

Cognitively, students often find unexpected or unprepared tasks overwhelming, especially as unpreparedness increases their cognitive load, making it more challenging to retrieve previously learned information. According to Cognitive Load Theory (Sweller, 1988), when students are required to engage in complex tasks without adequate preparation, their working memory becomes overloaded, leading to anxiety and impairing their ability to recall essential steps or formulas needed for problem-solving. This cognitive overload reinforces students' beliefs that they lack the capability to succeed, further intensifying their anxiety (Sweller, 1988; Ashcraft & Krause, 2007).

Insecurity About Performance in Oral Recitation

Insecurity is a common affective response among students who feel inadequate compared to their peers. As Khufra shared, "I feel insecure about myself when I can't answer the oral recitation activity." This sense of insecurity often stems from a fear of negative judgment by peers and teachers, impacting students' self-perception and potentially diminishing their motivation to engage in similar tasks in the future (Elliot & McGregor, 2001; Pekrun, 2006). Such emotional responses influence students' willingness to participate and shape their academic self-concept over time.

Insecurity can often result in withdrawal behaviors, where students refrain from participating in classroom activities to protect themselves from feelings of inadequacy. This withdrawal may manifest as reduced engagement, staying silent during discussions, or avoiding problem-solving tasks altogether. Such behaviors serve as self-protective strategies, helping students sidestep the emotional discomfort associated with insecurity and perceived inadequacy (Bandura, 1997; Ryan & Deci, 2000).

Cognitively, students experiencing insecurity may develop a fixed mindset, where they believe that their mathematical abilities are static and unchangeable. This belief further hinders their willingness to engage in classroom activities, as they assume they will not improve regardless of effort. Self-efficacy theory (Bandura, 1997) highlights how students with low self-efficacy tend to internalize failure and perceive difficult tasks as insurmountable challenges rather than growth opportunities.

Cognitively, insecurity can lead students to adopt a fixed mindset, believing that their mathematical abilities are unchangeable, which dampens their willingness to participate in classroom activities as they assume that effort will not yield improvement (Dweck, 2006). Self-efficacy theory (Bandura, 1997) suggests that students with low self-efficacy often internalize failure and view challenging tasks as insurmountable obstacles rather than development opportunities. This belief system not only limits their engagement but also reinforces their perception of difficulty as a reflection of inherent inability.

Students' emotional responses to classroom activities—nervousness, anxiety, and insecurity—are deeply intertwined with their beliefs about their own abilities and their fear of being judged. The ABC model provides a comprehensive framework to understand these responses, showing how emotions influence behaviors and cognitive perceptions. The theories of Self-Efficacy, Cognitive Load, and Achievement Goals help explain why students feel nervous, anxious, or insecure during oral tasks and what can be done to alleviate these emotional challenges.

Strategies for Coping with Academic Challenges

In both the In-Depth Interviews (IDI) and Focus Group Discussions (FGD), students shared various strategies they used to cope with academic challenges in mathematics classroom activities. Chou (IDI_1) emphasized the importance of staying focused on the topic and asking classmates for ideas when unsure, stating that it was crucial to gather insights from others to improve understanding. Miya (IDI_3) echoed this approach, explaining that she practiced solving problems and took notes after class to ensure she could answer when the topic came up again. Miya also mentioned the importance of being open to ideas from classmates and listening to their explanations to overcome difficult topics.

In the FGDs, Fanny (FGD_1) and Thamus (FGD_2) both highlighted the value of asking more knowledgeable classmates for help. Fanny explained that when faced with difficult tasks, she sought guidance from upper-year students to better understand the material. Thamus also emphasized that when confused about a topic, she would turn to classmates who had a stronger grasp of the subject. Johnson (FGD_3) mentioned that when financial constraints prevented him from accessing online resources, he relied on his classmates' explanations and created to-do lists to manage his workload effectively. Lancelot (FGD_4) noted that preparing in advance for reports helped reduce his struggle, while Khufra (FGD_7) mentioned borrowing laptops or seeking assistance with creating visual aids as a way to cope with his technical limitations. These strategies, including collaboration with peers, preparation, and the use of available resources, showcase how students proactively deal with the academic challenges they face in mathematics classroom activities.

In this subtheme, students discuss various strategies they use to manage the challenges they face in mathematics classroom activities. These strategies include seeking help from peers, independent studying and practicing, and using external resources like YouTube.

Seeking Help from Peers

One of the primary coping strategies mentioned by participants in mathematics classes is seeking support from peers. Layla, Fanny, and Johnson all highlighted the importance of consulting friends and classmates when tackling challenging topics. For instance, Layla frequently asked friends for clarification when she encountered difficulties in problem-solving, which helped reduce her anxiety. Peer support in academic contexts can help alleviate stress and enhance problem-solving abilities. Through peer interactions, students can discuss challenging concepts in a more relaxed setting, promoting openness about misunderstandings and mutual learning (Kiefer et al., 2015).

However, there is a claim that over-reliance on peers may lead to dependency, where students may not develop independent problem-solving skills if they continually seek answers from classmates (Schunk & Greene, 2018). This potential drawback highlights the importance of balancing peer support with individual effort. Nevertheless, as demonstrated by Fanny's experience, seeking help from peers provides immediate relief and can be especially valuable in time-sensitive situations, such as preparing for an exam or completing an assignment.

Emotionally, students feel relieved and supported when they seek help from their peers. The emotional comfort they get from peer support reduces feelings of isolation and frustration. Chou mentioned, "It's really important to ask for ideas... ask for ideas not only from yourself but also from your classmates". This highlights how emotional stress can be alleviated through collaborative learning, aligning with Vygotsky's Social Constructivism (1978), which posits that social interactions help build knowledge and reduce emotional strain.

Behaviorally, students demonstrate proactive actions by seeking assistance from peers when facing academic challenges. This is evident in Layla's comment, "I ask my friends and classmates who know more than me if my answer is correct". Students actively engage in discussions, ask questions, and clarify concepts with the help of their peers. Bandura's Social Learning Theory (1977) supports this, suggesting that students learn effectively by observing and interacting with their peers, reinforcing behaviors through social collaboration.

Cognitively, students view peer collaboration as an essential part of understanding complex mathematical problems. They recognize that sharing ideas with classmates can fill gaps in their knowledge. Constructivist Learning Theory (Piaget, 1954) reinforces the idea that students construct knowledge by interacting with others. Through peer discussions, students develop deeper insights into problems and improve their understanding of the material.

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Studying and Practicing Independently

Emotionally, independent studying and practicing help students build confidence and reduce anxiety over time. Miya stated, "I practice solving... After class, I open my notes or take down notes so next time, I have something to answer". This demonstrates how regular practice helps alleviate the emotional burden of future tasks by making students feel more prepared. This is aligned with Self-Efficacy Theory (Bandura, 1997), where the belief in one's ability to succeed increases with repeated practice and mastery of tasks.

Behaviorally, students commit to regular practice by reviewing their notes and solving problems on their own. This proactive behavior helps them build problem-solving skills and reinforce what they have learned in class. As Gusion remarked, "I study and practice solving because I'll get it eventually". This behavioral commitment to continuous learning reflects Cognitive Load Theory (Sweller, 1988), where repeated exposure to the material reduces cognitive overload and makes problem-solving easier in the future.

Cognitively, students engage in metacognition when they study independently. They assess their understanding, identify gaps in knowledge, and work towards improving their skills. This self-reflective cognitive process enables students to learn more effectively and retain information for longer periods. Metacognitive strategies (Zimmerman, 2002) are crucial for academic success, as they help students regulate their own learning by planning, monitoring, and evaluating their progress.

Using External Resources (YouTube, Online Tutorials, etc.)

Emotionally, using external resources such as YouTube tutorials provides reassurance and a sense of control over learning. Layla shared, "Sometimes I watch YouTube... I prefer asking my friends when we solve because I can ask if my answer is correct or wrong". This strategy reduces feelings of confusion and anxiety by allowing students to access alternative explanations, leading to emotional comfort. Mayer's (2001) Cognitive Theory of Multimedia Learning supports the idea that multimedia resources can enhance emotional engagement and reduce frustration by presenting information in both visual and auditory formats.

Behaviorally, students take the initiative to seek out additional learning materials online, demonstrating independence in their learning. By using resources like YouTube or online tutorials, they actively engage with the content outside of the classroom, ensuring they can keep up with difficult topics. Thamus mentioned, "When I get confused about classroom activities, I always go to a classmate who knows more about the topic". The behavior of seeking external resources reflects proactive learning behaviors, showing students' willingness to take control of their learning outside of formal settings (Zimmerman, 2002).

Cognitively, external resources like YouTube allow students to better understand and retain difficult concepts by providing alternative methods of explanation. These resources break down complex topics into simpler, more digestible parts. Cognitive Theory of Multimedia Learning (Mayer, 2001) explains that students benefit from both verbal and visual representations, which helps them understand abstract mathematical concepts more easily. By watching tutorials or using other online resources, students can fill in gaps in their knowledge and strengthen their cognitive grasp of the material.

In coping with academic challenges, students utilize strategies like peer collaboration, independent study, and external resources. The ABC model highlights how these strategies affect students emotionally (reducing anxiety and building confidence), behaviorally (engaging actively in learning), and cognitively (improving understanding and retention). Theories such as Social Learning, Self-Efficacy, and Multimedia Learning help explain why these strategies are effective in overcoming the challenges students face in the mathematics classroom.

Student Perceptions of Classroom Activities

In both the IDI and FGD, students shared diverse perceptions of classroom activities in their mathematics courses. Chou (IDI_1) recognized the value of group reporting, stating that it not only helped her learn more about the subject but also enhanced her teaching skills, which she found beneficial for her future role as a math teacher. Miya (IDI_3) appreciated the learning opportunities offered by group activities, explaining that while the tasks were challenging, they fostered collaboration and problem-solving skills. Saber (IDI_4), however, expressed some frustration with the heavy reliance on student reporting in major subjects, feeling that this approach, without enough instructor input, could be discouraging. He believed that direct instruction from teachers would better support students' understanding.

In the FGDs, students also provided mixed feedback on classroom activities. Fanny (FGD_1) found oral recitations intimidating, noting that they often undermined her self-confidence, but acknowledged the importance of being prepared for such activities. Thamus (FGD_2) shared a more positive view of reporting, explaining that presenting topics made her feel excited and helped her understand mathematics concepts more deeply. Similarly, Johnson (FGD_3) saw reporting as helpful but expected more challenging activities beyond group work. Meanwhile, Khufra (FGD_7) expressed a preference for reporting when given sufficient time to prepare, which allowed him to feel more confident and less nervous. Overall, students recognized the potential benefits of classroom activities in developing their knowledge and skills but expressed a desire for more variety in teaching strategies and greater instructor involvement to enhance their learning experiences.

Subtheme 3 addresses how students perceive various classroom activities in mathematics, particularly group activities, and the role of teachers in clarifying concepts. These were presented using the ABC (Affective, Behavioral, Cognitive) model, broken down into emotional responses (Affective), behaviors (Behavioral), and beliefs or attitudes (Cognitive).

Value of Group Activities

Emotionally, students tend to feel positive and motivated by group activities, as these allow for collaboration and shared learning. Chou expressed this sentiment, stating, "Group reporting is important because aside from learning, you gain a lot of new knowledge... It also enhances my teaching skills as a future teacher". The positive emotional engagement in group activities reduces the anxiety and isolation that students often experience when working individually on complex tasks. According to Social Interdependence Theory (Johnson & Johnson, 2009), cooperative learning fosters positive emotional connections between students, as success depends on collaboration, which enhances motivation and reduces stress.

Behaviorally, students actively engage in group tasks, contributing to discussions and sharing responsibilities. Jaw Head emphasized that "Classroom activities are really helpful because as a student, I feel more challenged to increase my knowledge". This behavior reflects active participation and interaction within the group. Constructivist Learning Theory (Piaget, 1954) supports the idea that students learn better when they are actively involved in the process of knowledge construction, particularly through group discussions and collaboration. Students' behaviors during group work, such as dividing tasks and explaining concepts to one another, indicate higher engagement and a deeper level of understanding.

Cognitively, students perceive group activities as valuable tools for deepening their understanding of complex mathematical concepts. They view collaboration as a means to gain different perspectives and clarify difficult concepts through peer discussions. Vygotsky's Social Constructivism (1978) emphasizes that learning occurs through social interaction, particularly when students work with peers who have different levels of knowledge. Group activities allow students to process information more effectively by explaining ideas to each other, which reinforces their cognitive understanding of the material.

Importance of the Teacher's Role in Clarifying Concepts

Emotionally, students feel frustrated when teachers do not provide sufficient clarification during classroom activities. Saber highlighted this frustration, saying, "It's better if the instructor really teaches, not just rely on students because it's all reporting from them... It can really discourage my interest in school". This emotional response reflects the importance of teacher involvement in reducing confusion and ensuring that students feel

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supported in their learning. When teachers offer clear explanations, it fosters a more positive emotional connection to the subject and reduces the feelings of anxiety that can result from unclear or incomplete instruction.

Emotionally, students often experience frustration when teachers fail to provide adequate clarification during classroom activities. Saber expressed this frustration, noting, "It's better if the instructor really teaches, not just rely on students because it's all reporting from them... It can really discourage my interest in school." This reaction underscores the importance of teacher involvement in minimizing confusion and ensuring students feel supported in their learning. When teachers offer clear explanations, it fosters a more positive emotional connection to the subject and alleviates the anxiety that can arise from unclear or incomplete instruction (Hattie, 2009; Titsworth et al., 2015).

Behaviorally, students are more engaged and willing to participate when they feel supported by their teacher's guidance. Estes shared that "The instructor should give further explanations so I can better understand the activities given". Students are more likely to ask questions, seek clarification, and participate in class discussions when they feel that their teacher is providing clear and helpful guidance. Scaffolding Theory (Wood et al., 1976) explains that teacher support is crucial for guiding students through difficult tasks. When teachers provide the right amount of assistance, students are more likely to engage in behaviors that promote learning, such as asking questions or attempting more challenging problems.

Cognitively, students see the teacher's role as essential for making sense of difficult mathematical concepts. Without clear explanations from the teacher, students may develop misconceptions or incomplete understandings of the material. Cognitive Apprenticeship Theory (Collins et al., 1987; Collins et al., 1989) supports the idea that teachers should model expert thinking and guide students through the learning process. Students learn best when they can observe and emulate the problem-solving strategies of an expert, which helps them develop a clearer cognitive understanding of how to approach complex tasks.

Using the ABC model, we see that students' perceptions of group activities and the teacher's role in the classroom involve emotional, behavioral, and cognitive dimensions. Group activities evoke positive emotions, promote active participation, and enhance cognitive understanding through collaboration, while teacher guidance is critical for reducing frustration, increasing engagement, and promoting deeper comprehension of difficult concepts. Theories such as Social Interdependence, Scaffolding, and Cognitive Apprenticeship highlight the importance of both peer collaboration and teacher intervention in effective learning.

Educational Implications

The findings of this study have several important implications for teaching practices in mathematics classrooms:

1. **Addressing Emotional Barriers to Learning**: Students' emotional responses, such as nervousness, anxiety, and insecurity during mathematics activities, highlight the need for educators to create supportive environments that reduce performance-related stress. Teachers can implement strategies that foster emotional safety, such as offering more preparation time before public tasks, using formative assessments that allow students to build confidence, and promoting a growth mindset where mistakes are seen as opportunities for learning. Addressing emotional barriers aligns with **Bandura's Self-efficacy Theory** (1997), which suggests that increasing students' belief in their abilities can improve their academic performance. Instructors or professors can give ahead of time the assignments like class presentations or reportings so that they have plenty of time to research and study the material and might as well give them the resources for alignment and uniformity of ideas.
2. **Promoting Collaborative Learning**: The positive reception of group activities indicates that collaborative learning should be an integral part of mathematics instruction. Group work not only enhances emotional well-being by reducing individual pressure but also facilitates cognitive development through peer teaching. **Vygotsky's Social Constructivism** (1978) supports the idea that

students learn more effectively when they engage in social interactions with their peers. Teachers should encourage peer collaboration and design tasks that allow students to share knowledge and learn from one another. Giving problem sets to be answered and presented by the group is one way of improving this area. Likewise giving group assignments to be presented by any member is not only improving the cognitive skills of the students but also enhancing their collaborative skills relevant in their future endeavors.

3. **Teacher's Role in Clarification and Guidance**: The study underscores the importance of the teacher's role in clarifying difficult concepts and providing scaffolding during challenging tasks. Students' frustration with a lack of teacher involvement during student-led activities suggests that while collaborative learning is important, teacher guidance remains crucial for deep understanding. **Scaffolding Theory** (Wood, Bruner, & Ross, 1976) emphasizes that teachers should provide the right amount of support to help students navigate complex problems. Teachers should balance student-led learning with direct instruction to ensure all students grasp key concepts. During collaborative group activities, math instructors or professors can visit each group and assist or guide them on how to solve the problems.
4. **Incorporating External Resources**: The use of external resources, such as YouTube and online tutorials, shows that students are increasingly relying on technology to supplement classroom learning. This implies that educators should integrate technology into their teaching to offer diverse methods of explanation. **Mayer's Cognitive Theory of Multimedia Learning** (2001) highlights the effectiveness of multimedia in enhancing students' understanding of difficult concepts by combining visual and auditory elements. By incorporating online tutorials and visual aids into the curriculum, teachers can support diverse learning styles and provide additional resources for struggling students. In addition, letting the students make use of AI (artificial intelligence) tools such as ChatGPT, Gemini, CICI, etc can help them understand better the processes of solving problems by comparing different procedures provided by such AI tools.

The study indicates that addressing emotional challenges, promoting collaborative learning, providing effective teacher guidance, and integrating technology is key to improving student experiences and outcomes in mathematics education. These findings call for a more holistic approach to teaching that not only focuses on cognitive development but also considers students' emotional and social needs.

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