Original Research Article

FLIPPED CLASSROOM ON STUDENTS’ MATHEMATICS PERFORMANCE: A QUALITATIVE STUDY

ABSTRACT

|  |
| --- |
| **Aims:** The study aimed to explore the lived experiences of Grade 8 students with the flipped classroom strategy in the context of mathematics education, focusing on their engagement, attitudes, and learning behaviors.  **Study design:** The research employed a qualitative research design, utilizing student interviews as the primary method of data collection. This approach allowed for an in-depth exploration of students' perspectives and emotional and behavioral responses to the flipped classroom model.  **Place and Duration of Study:** The study was conducted at Dawan National High School, Mati City, Davao Oriental, Philippines, during the third quarter of the 2024–2025 school year.  .  **Methodology:** This study employed a **qualitative research design** to explore the lived experiences and perceptions of students following the implementation of a flipped classroom strategy. The data collection phase utilized **Focus Group Discussions (FGDs)** and **In-Depth Interviews (IDIs)** with **ten purposefully selected participants** from the experimental group, ensuring representation across various levels of engagement, performance, and demographic backgrounds. A **semi-structured interview guide**, validated by subject matter experts, was used to provide clarity, relevance, and alignment of questions with the study's objectives. Ethical standards, including informed consent and participant confidentiality, were strictly adhered to in this study.  Data were analyzed using **Braun and Clarke’s (2006) six-phase thematic analysis framework**, which included familiarization, coding, theme development, review, definition, and reporting. This systematic approach enabled the identification of recurring themes that reflected emotional, cognitive, and behavioral responses to the experience of the flipped classroom.  To ensure **rigor and trustworthiness**, the results were presented to the participants for verification of the accuracy of the synthesized findings.  **Results:** Findings revealed that many students in the flipped classroom reported increased motivation, confidence, and a stronger sense of autonomy. They appreciated having access to instructional materials in advance, which allowed them to learn at their own pace and come to class better prepared. This pre-class exposure fostered deeper engagement and the development of critical thinking skills.  However, the approach also presented challenges, particularly for students who struggled with time management, self-discipline, and independent learning. These difficulties were more commonly voiced by students whose learning preferences did not align with the demands of flipped instruction. While gender differences were not directly evident in the thematic findings, some reflections, particularly from female students, hinted at a connection between organizational skills and mathematics success.  Overall, the qualitative findings highlighted that the flipped classroom nurtures key 21st-century skills such as self-regulation, motivation, and communication, offering a more meaningful and student-centered learning experience. Nevertheless, its effectiveness depends on the readiness and support structures provided to learners. The study emphasizes the importance of incorporating inclusive and differentiated strategies to meet the diverse needs of students and ensure equitable learning outcomes in a flipped learning environment.  **Conclusion:** The qualitative findings of this study highlight that the flipped classroom approach offers significant benefits in terms of affective and behavioral outcomes for Grade 8 students, particularly in fostering motivation, confidence, and learner autonomy. Students valued the opportunity to engage with instructional materials at their own pace, which contributed to a more meaningful and reflective learning experience. These outcomes suggest that the flipped model not only supports mathematics development but also cultivates essential 21st-century skills such as self-regulation, critical thinking, and effective communication.  However, the approach is not without its challenges. Some students encountered difficulties in managing their time, maintaining self-discipline, and adapting to the independent nature of flipped learning, particularly those with learning styles that are less suited to this format. These mixed experiences underscore the need for responsive and inclusive pedagogical strategies that take into account individual learner differences.  In conclusion, while the flipped classroom may not be universally effective, it holds strong potential when thoughtfully implemented with adequate support, scaffolding, and differentiation. To optimize its impact, educators must ensure that students are equipped with the necessary skills and resources to thrive in a learner-centered environment. Future applications should prioritize flexible, student-responsive practices that promote both mathematics success and personal growth.  . |

Keywords: Flipped Classroom, Gender Differences, Instructional Approach, Mathematics Performance, Traditional Classroom

**1. INTRODUCTION**

Mathematics plays a crucial role in developing students' logical reasoning and problem-solving skills, serving as a cornerstone subject in both elementary and secondary education (Ariyanti & Santoso, 2020). However, despite a strong foundation in early grades, many students encounter increasing difficulty in mastering mathematics as they progress to higher levels (Tian, 2023). This challenge is often attributed to the continued reliance on traditional, lecture-based teaching methods, which emphasize passive knowledge transfer and leave little room for the development of critical thinking and independent learning skills (Naik, 2023).

The need for instructional reform is further compounded by structural and environmental disruptions that limit classroom learning time. Factors such as congested mathematics schedules, unplanned school suspensions due to extreme weather events and natural disasters (Executive Orders No. 09, 21 [s.2024]; No. 105 [s.2023]), and condensed curricula per DepEd Order No. 31 (s.2012), have significantly reduced opportunities for in-depth mathematics instruction. These time constraints hinder students’ ability to engage with complex concepts and reinforce learning through practice (Chi, 2023). As a result, the effectiveness of the traditional approach has come under increasing scrutiny for its inability to foster deep learning or accommodate modern educational demands.

In light of these challenges, according to Nuevo and Valdez (2024), implementing a well-structured action plan is instrumental in future-proofing mathematics education against potential disruptions. Their study recommends that such a proactive approach equips both teachers and students to navigate educational challenges effectively. Inside the action plan, alternative teaching methods could be used, such as the flipped classroom approach, which has become increasingly popular. Innovative instructional strategies are being explored to ensure continuity and quality in mathematics education. One promising alternative is the flipped classroom approach, which reverses the conventional model by delivering instructional content outside the classroom, typically through videos or digital platforms, while dedicating class time to interactive, application-based activities (Naik, 2023; Lms, 2023). This learner-centered model enables teachers to transition from lecturers to facilitators, fostering higher-order thinking skills and collaborative problem-solving.

Extensive studies, such as those by Centeno (2021), have demonstrated the effectiveness of the flipped classroom across various educational levels and disciplines. Macale et al. (2021) further confirmed its positive impact on developing students' process skills, particularly in mathematics. However, despite quantitative evidence supporting its benefits, a gap remains in understanding how students personally experience and interpret this instructional shift—an essential perspective for evaluating the practical viability and long-term sustainability of flipped learning models.

Thus, the present study focuses on the qualitative dimension of flipped classroom implementation, particularly among Grade 8 mathematics students. By exploring students' lived experiences, perceptions, and attitudes through focus group discussions and in-depth interviews, this study aims to gain nuanced insights into the emotional, cognitive, and behavioral aspects of learning in a flipped environment. The findings contribute to the growing discourse on inclusive, adaptive pedagogies, providing a learner-centered foundation for future instructional design in mathematics education.

**2. MATERIAL AND METHODS**

**Research Design**

This study adopted a qualitative approach to explore the lived experiences, perceptions, and attitudes of Grade 8 students towards the flipped classroom approach in mathematics. Focus Group Discussions (FGDs) and In-Depth Interviews (IDIs) served as the primary qualitative tools. These methods enabled a comprehensive understanding of student engagement, motivation, and the impact of flipped learning on classroom interaction. Thematic analysis was applied using the six-phase framework proposed by Braun and Clarke (2006), which enabled the identification and interpretation of significant themes related to the participants' mathematics and personal development (Hands, 2022).

**Sampling**

The study was conducted at Dawan National High School during the 2024–2025 mathematics year. For the qualitative component, purposive sampling was utilized to select 10 students from the flipped classroom group. This method ensured the inclusion of participants capable of offering in-depth, meaningful insights into the flipped classroom experience (Campbell et al., 2020).

Purposive sampling strengthens the contextual and analytical depth of qualitative data, allowing the study to reflect a range of experiences within the learning environment. Selected participants took part in both focus group discussions (FGDs) and individual interviews (IDIs), providing rich narratives on the benefits, challenges, and personal implications of the flipped classroom approach.

**Procedure for the Implementation of the Flipped Classroom**

**Securing Authorization and Ethical Clearance**

Before implementation, the researcher obtained formal permission from the Dean of the Graduate School, the Superintendent of Mati City's Schools Division, and the Principal of Dawan National High School. Ethical compliance was ensured through the acquisition of parental consent forms, which detailed the study's objectives, benefits, and potential risks.

Participants were informed about the nature and purpose of the study through a comprehensive informed consent letter, which outlined their rights, the voluntary nature of participation, and the confidentiality of their data. According to Republic Act 10173 (Data Privacy Act), all personal information is kept confidential and secured by the researcher, with data access restricted exclusively to the researcher and used solely for mathematical purposes.

In alignment with the Belmont Report, participants were selected equitably and treated impartially, regardless of background, ensuring fairness in the distribution of research benefits.

**Implementation Steps**

1. ***Define Learning Objectives***: Learning goals aligned with the Essential Learning Competencies (MELCs) were identified for five selected topics.
2. ***Create and Curate Pre-Class Materials****:* Video lectures (15–20 minutes), supplementary readings, and accessible formats were prepared.
3. ***Design In-Class Activities****:* Sessions emphasized active learning, incorporating group discussions, problem-solving exercises, and formative assessments to promote student engagement and learning.
4. ***Orient Students****:* Orientation sessions introduced students to the flipped model and effective engagement strategies.
5. ***Monitor Progress****:* The researcher conducted regular check-ins and provided additional support mechanisms as needed.
6. ***Evaluate and Refine****:* Feedback was used to adjust instructional strategies and materials.

**Potential Conflicts of Interest**

The implementation of the flipped classroom presented several challenges and potential conflicts of interest for student participants:

1. ***Access to Resources****:* Unequal access to technology and the internet posed barriers to viewing pre-class materials. Some students also lacked a conducive study environment at home.
2. ***Preparedness for Class****:* The model required self-directed learning, which some students found difficult without immediate teacher support. Differences in learning styles also influenced adaptation to the new format.
3. ***Pressure and Accountability****:* Active participation during class time sometimes caused anxiety, particularly when students were unprepared for the material. Additionally, concerns about assessment accuracy and fairness arose.
4. ***Support from Teachers and Administration****:* Inconsistent support and a lack of resources or training for teachers impacted the overall effectiveness of the flipped classroom experience.

**Administration and Validation of Instruments**

Expert validation ensured the credibility of both the quantitative tests and qualitative interview protocols. Revisions based on expert feedback improved clarity and alignment with research objectives. This strengthened the study’s methodological rigor.

**Data Collection**

Following the implementation of the flipped classroom, the qualitative data collection phase was initiated. Using validated semi-structured guides, focus group discussions (FGDs) and individual interviews (IDIs) were conducted with 10 participants who were purposively selected. These discussions were audio-recorded, transcribed, and securely stored to ensure the integrity of the data.

**Data Analysis**

Braun and Clarke’s (2006) six-phase thematic analysis was employed:

1. **Familiarization**: Transcripts were read repeatedly.
2. **Initial Coding**: Key ideas were identified and coded.
3. **Theme Development**: Codes were grouped into themes.
4. **Reviewing Themes**: Themes were refined and validated.
5. **Defining Themes**: Themes were clearly articulated.
6. **Reporting**: Results were written using direct quotations.

A presentation was conducted for the participants to verify the accuracy of the interpretations, thereby enhancing the study’s trustworthiness.

**Presentation of Qualitative Findings**

Findings were presented narratively, supported by participant quotations that illustrated the themes. This format facilitated an in-depth exploration of students' perceptions and experiences. Tables and matrices were also used to enhance clarity and facilitate the comparison of emergent themes.

3. results and discussion

This section presents the findings and discussion derived from the qualitative data gathered through student responses during the implementation of the flipped classroom approach. It centers on the emergent themes that reflect the students’ lived experiences, perceptions, and mathematical behaviors in the context of mathematics learning. The analysis, grounded in thematic interpretation, reveals how students navigated and responded to the flipped learning environment, providing nuanced insights into the model’s impact on their engagement, challenges, and emotional responses.

**Lived Experiences of the Students in Flipped Classroom**

The lived experiences of Grade 8 students who were exposed to the flipped classroom technique in mathematics are presented in this section. Focus groups and in-depth interviews were used to gather data, which was then subjected to thematic analysis.

This study examines the experiences of students in flipped classrooms, highlighting the enhancement of involvement and improvement in mathematics performance as significant benefits. However, challenges such as initial resistance and time management problems are noted.

After analyzing the responses of the participants about their experiences in learning Mathematics in a flipped classroom, the following themes emerged: (1) Self-Directed Learning and Independence, (2) Cognitive Growth**,** (3) Emotional and Psychological Challenges, (4) Time Management and Discipline (5) Motivation & Confidence (6) Mixed Effectiveness**.**

*Table 1. Codes and Themes of the lived experiences of the Grade 8 students*

|  |  |  |
| --- | --- | --- |
| **Research Question** | **Codes** | **Themes** |
| What are the lived experiences of students under a flipped classroom approach? | Taking ownership of learning, Pre-class preparation, and Active participation | Self-Directed Learning and Independence |
| Independent study; Confidence in discussion | Self-Directed Learning and Independence |
| Active learning: Concept clarification | Cognitive Growth |
| Reinforced learning; Better retention | Cognitive Growth |
| Low confidence, Public speaking anxiety | Emotional and Psychological Challenges |
| Nervousness; Instructional confusion | Emotional and Psychological Challenges |
| Task prioritization; Discipline | Time Management and Discipline |
| Lack of independent study; Peer reliance | Time Management and Discipline |
| Confidence boost; Preparation reduces fear | Motivation & Confidence |
| Motivation to engage; Mathematics readiness | Motivation & Confidence |
| Lack of discussion; Independent struggle | Mixed Effectiveness |
| Varying comprehension; Topic difficulty | Mixed Effectiveness |

Table 1 shows that participants reported improved self-directed learning and cognitive growth within the flipped classroom in mathematics. However, emotional challenges and time management problems have emerged as significant obstacles. Despite these obstacles, motivation levels have remained high, contributing to the perceived effectiveness of the model in fostering a more profound commitment and understanding of mathematical concepts.

***Theme 1: Self-Directed Learning and Independence***

One prominent theme that emerged from the qualitative data was the enhancement of students' self-directed learning and autonomy through the use of the flipped classroom model. Participants consistently described how this pedagogical approach shifted the responsibility of learning onto them, fostering a sense of ownership and preparation prior to classroom discussions.

For example, participant SFL\_08 shared:

*“Kami mismo ang mag study sa topic para discuss namo tubing sa among classmates.”*

("We study the topic ourselves so we can discuss it in front of our classmates.")

Similarly, participant SF\_05 reflected:

*“Ang flipped classroom nga pamaagi nakausab sa akong paagi sa pagkat-on kumpara sa tradisyonal nga pagtudlo, kay una, ako na mismo ang nagtuon sa leksyon sa akong kaugalingon. Dayon, among hisgutan kini sa atubangan sa klase, ug kung mangutana na ang maestra, kabalo na ko sa tubag kay nakakat-on na ko daan.”*

("The flipped classroom changed my way of learning compared to traditional teaching. First, I study the lesson on my own. Then, we discuss it in class, and when the teacher asks, I already know the answer because I taught it beforehand.")

These statements demonstrate that students not only assumed greater responsibility for their learning but also engaged more actively in class activities as a result of improved preparation.

This finding aligns with Chikeme et al. (2024), who emphasize that flipped classrooms promote mathematics preparedness and self-regulated learning, leading to improved performance and autonomy. Similarly, Choi, Jakob, and Anderson (2021) highlight that the flipped model encourages intellectual engagement before class, preparing students to participate meaningfully during instructional time.

Moreover, Hsieh and Maritz (2023) found that the flipped approach fosters both intrinsic and extrinsic motivation, enhancing students’ mathematics resilience and independence. These scholarly perspectives support the experiences of participants in this study, confirming that the flipped classroom nurtures a more engaged, proactive, and autonomous learner, critical attributes for success in mathematics and other subjects.

***THEME 2: Cognitive Growth***

Another key theme that emerged from the qualitative data is the enhancement of cognitive growth and a deeper conceptual understanding of mathematics through the use of the flipped classroom approach. Participants reported that encountering the content twice—once independently and once during a teacher-facilitated discussion—led to a clearer understanding of mathematical concepts.

Participant SFL\_08 emphasized:

*“Oo, Ma’am, kay makat-on ko sa leksyon duha ka beses—magtuon ko daan, unya ipasabot sa maestra aron klaro ang mga butang nga wala namo nasabtan.”*

("Yes, ma'am, because I learn the lesson twice—I study in advance, and then the teacher discusses it to clarify anything we did not understand.")

Similarly, SFL\_03 highlighted the role of the approach in promoting critical thinking:

*“Oo, Ma’am, kay nagpahugot sa atong pagkat-on, pero kinahanglan gyud nato magbasa aron masabtan ang topic. Maayo ni, Ma’am, kay magtudlo kini sa atong hunahuna nga dili lang ta magsalig sa maestra—kinahanglan maghunahuna ta kritikal, Ma’am.”*

("Yes, ma'am, because it sharpens our learning, but we need to read to understand the topic. It is good, ma'am, because it trains our minds not to rely too much on the teacher—we have to think critically, ma’am.”)

These reflections demonstrate that students experienced significant improvements in comprehension and cognitive processing through repeated exposure and the opportunity to clarify gaps in their understanding. They also developed habits of critical analysis and independent reflection, which are essential for success in mathematics.

These insights are supported by Naik (2023) and Egara and Mosimege (2023), who found that flipped classrooms enhance mathematical achievement and promote self-regulated learning. Centeno et al. (2021) likewise observed that repeated exposure to materials and collaborative learning tasks strengthens students' confidence and understanding.

Furthermore, Ay and Dağhan (2023) emphasize that flipped classrooms foster cognitive presence through structured, student-centered activities. Hwang et al. (2023) emphasize the sustained benefits of flipped learning in maintaining students' engagement in mathematics, while Pang (2022) and Nugraheni et al. (2022) highlight the approach's effectiveness in promoting critical thinking and motivation. Finally, Shi et al. (2020) and Zheng and Zhang (2020) argue that flipped instruction facilitates higher-order thinking, rendering the learning experience both personalized and transformative.

These qualitative findings confirm that the flipped classroom model not only improves mathematics outcomes but also cultivates cognitive and metacognitive skills essential for lifelong learning.

***THEME 3: Emotional and Psychological Challenges***

While the flipped classroom model promotes autonomy and active engagement, qualitative data also revealed significant emotional and psychological challenges that students encountered during its implementation. These included anxiety, difficulty in concentration, and the pressure associated with self-directed learning.

Participant SFL\_06 reflected:

*“Ang akong kahadlok sa pag-estorya sa atubangan sa mga tawo. Naa koy stage fright, Ma’am, ug maulaw ko mag-isturya sa atubangan sa klase.”*

("My challenge while learning in a flipped classroom setup is my fear of speaking in front of people. I have stage fright, ma'am, and I feel shy when talking in front of the class.")

Similarly, SFL\_10 shared:

*“Nag-atubang ko ug mga kalisdanan sa pagsabot sa leksyon ug kinahanglan pa nako magbutang og mas dako nga paningkamot sa pagtuon, Ma’am, kay kinahanglan nako magtuon pirmi. Apan usahay, maglisod ko mag-focus kay maggugol ko og oras sa pagdula sa akong cellphone.”*

("I face struggles in understanding the lesson and need to put in more effort to study, ma'am, because I have to study constantly. However, I sometimes find it hard to focus since I spend time playing on my phone.”)

These reflections illustrate the psychological strain some students experienced as they adapted to increased mathematics responsibility. Feelings of stage fright, stress from performance-based tasks, and distractions during self-study emerged as recurring challenges. For students unaccustomed to independent learning, the absence of constant teacher guidance occasionally led to frustration and emotional fatigue.

These findings align with those of Korkmaz and Mirici (2023), who emphasize that while flipped classrooms offer innovative educational benefits, they can also intensify anxiety due to the increased demands of self-regulation and the reduced availability of immediate support. Similarly, Kim (2024) and Wei and Huang (2024) suggest that early scaffolding and structured emotional support are crucial in reducing learner anxiety in such settings.

Furthermore, Anjomshoa et al. (2022) and Zhou (2023) assert that these emotional challenges influence students' ability to self-regulate, impacting both learning outcomes and peer relationships. Avakyan and Taylor (2024) highlight that learning environments lacking emotional scaffolding may undermine students' basic psychological needs and lower their self-esteem. As Sánchez et al. (2020) argue, understanding and addressing these psychological dimensions are essential to fostering an effective and inclusive flipped learning environment.

Overall, while the flipped classroom enhances student-centered learning, the emotional and psychological toll it may exert on students calls for supportive interventions that address confidence, focus, and well-being alongside mathematics skills.

***THEME 4: Time Management and Discipline***

The flipped classroom model requires students to take greater personal accountability, particularly in managing their time and maintaining discipline. Data from student responses indicate that many learners adapted by implementing strategies to manage distractions and structure their study routines.

Participant SFL\_07 explained:

*“Gimanage nako ang akong oras sa pagtuon sa balay pinaagi sa paghimo og study schedule, Ma’am. Ang flipped classroom nga pamaagi nanginahanglan ug daghang oras aron masiguro nga masabtan nako og husto ang mga leksyon.”*

("I managed my time when studying at home by creating a study schedule, ma'am. The flipped classroom approach requires much time to ensure that I fully understand the lessons.")

SFL\_10 echoed similar sentiments, sharing:

*“Gimanage nako ang akong oras pinaagi sa pagkunhod sa paggamit sa akong cellphone ug mga 2 ka oras aron makatuon ko og mas taas nga panahon sa dili pa klase.”*

("I managed my time by reducing my phone usage by about 2 hours so that I could study for a longer time before class.")

These responses highlight students’ efforts to adopt disciplined study habits, such as creating structured schedules and limiting distractions, to meet the demands of the flipped learning model. For many, this meant establishing boundaries around digital usage and proactively organizing their learning time at home.

These findings align with Smith's (2021) observation that structured personal responsibility is closely linked to mathematics success, particularly in self-paced learning environments. Pérez-Sanagustín et al. (2021) further support the idea that scaffolding self-regulated learning strategies, including goal setting, time monitoring, and strategic help-seeking, enhances student engagement and autonomy.

Moreover, Sargent and Casey (2020) emphasize that when students are equipped with practical time management skills, they can better capitalize on the advantages of active, in-class application. Brandon (2020) reinforces this by stating that the success of innovative approaches, such as flipped learning, hinges on students' ability to manage their learning time efficiently outside the classroom.

Overall, flipped classrooms place more of the burden of duty on the students, but those who acquire discipline and time management techniques are more likely to succeed. These results underscore the importance of providing integrated support and guidance on self-regulation techniques when implementing flipped learning.

***THEME 5: Motivation and Confidence***

The flipped classroom model significantly enhances student motivation and confidence by promoting active, self-directed learning. Shifting instruction outside the classroom cultivates learner autonomy and deeper engagement (Zheng et al., 2020; Cevikbas & Kaiser, 2022; Nugraheni et al., 2022), which in turn fosters a stronger sense of self-efficacy (Abdullah et al., 2020).

SFL\_09 reflected on the confidence gained through independent learning:

*“Taas kaayo akong confident kay na-equipped ko sa pagkat-on sa akong kaugalingon nga kritikal ug praktikal.”*

("I am highly confident because I have been equipped to learn on my own, both critically and practically.")

Similarly, SFL\_01 stated:

*“Naa ko’y taas nga kumpiyansa sa pag-aplikar sa akong natun-an pinaagi sa flipped classroom method kay ang uban nga topics gikan sa learning materials sayon ra nako masabtan. Proud ko kay nakasabut ko sa topic nga wala ang discussion sa maestra.”*

("I feel highly confident in applying what I have learned through the flipped classroom method because some topics from the learning materials are easy for me to understand. I am proud that I can grasp the topic even without the teacher's discussion.")

These responses are consistent with the findings of Doğan, Batdı, and Yaşar (2023), who emphasized that students' learning styles and preferences influence the success of flipped learning environments. Learners who rely heavily on direct instruction or who are less inclined toward reading-based study may find the model challenging. Garcia-Ponce and Mora-Pablo (2020) also observed that the complexity of the subject matter significantly affects student engagement, which supports SFL\_01's comment about topic difficulty impacting comprehension.

Although some students thrived in the flipped setup—benefiting from its flexibility and self-paced structure—others faced barriers such as limited real-time teacher support and increased pressure for self-regulation. These varied responses reinforce the findings by Cho, Melloch, and Levesque-Bristol (2021), who noted that the perceived effectiveness of flipped classrooms depends on how well the model is structured and supported. Furthermore, El Sadik and Al Abdulmonem (2021) noted that flipped classrooms can enhance learning in complex subjects, provided that sufficient scaffolding is in place.

In conclusion, while the flipped classroom can improve motivation, engagement, and mathematics performance for some learners, its impact is not universally positive. These findings underscore the importance of adaptive instructional design that considers learner diversity, content difficulty, and the need for ongoing support, factors crucial to optimizing the effectiveness of the flipped classroom model.

***THEME 6: Mixed Perception of Effectiveness***

The flipped classroom model yielded mixed perceptions among students, highlighting both its benefits and its limitations. While the model aims to foster active learning and independence, not all students found it equally effective, underscoring the need for a more nuanced and flexible approach to its implementation.

SFL\_01 shared their struggle with lesson comprehension, especially when the content was complex:

*“Nalisdan ko sa pagsabot sa mga leksyon tungod kay sa akong opinyon, dili sayon ang mga topic. Nagdepende ra man pud sa topic, Ma’am.”*

("I find it harder to understand the lessons because, in my opinion, the topic is not easy. It depends on the topic, ma'am.")

Similarly, SFL\_02 noted that their difficulty stemmed from their personal learning preferences:

*“Lisod ma’am oy! Kay dili man ko reader ma’am. Dili man ko hilig magbasa-basa ma’am maong lisod.”*

("It was difficult, ma'am! It is hard if you are not a reader. I am not fond of reading, which is why I struggle, ma’am. That is why I ask for help from my classmates, ma’am.”)

These reflections align with the findings of Doğan, Batdı, and Yaşar (2023), who emphasized that the effectiveness of flipped classrooms is highly dependent on students’ learning preferences. Students who are less inclined to read independently or who depend more heavily on teacher guidance may find the model less supportive. Additionally, Garcia-Ponce and Mora-Pablo (2020) highlighted that the complexity of mathematics content can significantly influence student engagement and learning outcomes, supporting SFL\_01's view that topic difficulty directly affects their experience.

While some students benefited from the flexibility and active learning structure of the flipped model, others encountered barriers due to reduced real-time teacher interaction and the increased cognitive demands of self-regulated learning. These contrasting responses reinforce the observation of Cho, Melloch, and Levesque-Bristol (2021), who found that students' perceptions of flipped learning vary based on how well the model is structured and supported. Furthermore, El Sadik and Al Abdulmonem (2021) argued that flipped strategies can improve student performance in challenging subjects, suggesting that additional scaffolding and support may be necessary for struggling learners to benefit from the approach fully.

Overall, while the flipped classroom fosters autonomy and can enhance mathematics performance, its effectiveness is not uniform. Students' experiences depend on their learning styles, the complexity of the content, and the availability of appropriate support systems. These findings highlight the importance of adaptive instructional design that considers learner diversity to maximize the impact of flipped learning environments.

1. Conclusion

The qualitative findings of this study provide meaningful insights into Grade 8 students' lived experiences with the flipped classroom approach in mathematics. Through thematic analysis of student interviews, it became evident that the flipped model fostered self-directed learning, critical thinking, and increased motivation and confidence among many learners. Students reported valuing the ability to engage with lessons at their own pace. They appreciated the autonomy in navigating learning materials, which often translated into a deeper understanding and a greater sense of pride in their mathematics achievements.

However, the study also revealed important challenges. Some students experienced difficulty adjusting to independent study, citing struggles with time management, limited reading motivation, and reduced real-time interaction with their teachers. These barriers were particularly evident among learners whose styles were less aligned with the self-regulatory demands of flipped instruction. This reinforces the need to design flipped classrooms with adequate scaffolding, structured support systems, and consideration for diverse learning preferences.

Thematic results also indicated that perceptions of effectiveness varied, with students' experiences influenced by the complexity of the topic, individual study habits, and access to peer or teacher assistance. These mixed responses suggest that while the flipped classroom holds substantial promise, its impact is not universally positive and depends on various learner-specific and contextual factors.

Overall, the qualitative data support the conclusion that the flipped classroom can enrich learning by nurturing autonomy, confidence, and engagement. However, its successful implementation requires planning, inclusive strategies, and ongoing support to ensure all students, regardless of background, learning style, or mathematics confidence, can benefit from this innovative approach.

**Ethical CONSIDERATIONS**

A letter requesting permission was sent to the office of the school division superintendent for approval to conduct the study. A copy of the approval letter was provided to the school head. All participants were given informed consent. The purpose of the informed consent letter was to introduce the research, provide contact details, explain the study’s purpose, and request the recipient's voluntary participation in the study.

The informed consentletter also stated that respondents’ background information would be kept confidential and would not be released without their prior expressed approval. After obtaining consent, the researcher collected and secured it to ensure the security and confidentiality of the respondents. Furthermore, in compliance with RA 10173, also known as the Data Privacy Law, all gathered information will be treated with the strictest confidentiality, with only the researcher having access to the data, which will be utilized primarily for the study’s purposes. With this, the researcher will assure the respondents that their anonymity and privacy will be protected, thereby contributing to the confidentiality of their responses.

The Belmont report emphasizes the importance of selecting research subjects based on the requirements of the study. Consequently, the researcher will ensure that all participants, regardless of their backgrounds, are treated equitably and receive a fair distribution of the benefits offered by the research. This commitment aligns with the ethical principles outlined in the report, which prioritize fairness and impartiality in the selection and treatment of participants.

**POTENTIAL CONFLICT OF INTEREST OF STUDENTS**

As students experience the flipped classroom approach in mathematics, they may encounter several conflicts of interest that affect their learning experience and mathematics performance.

1. *Access to resources –* the study may have a technology gap; the flipped classroom relies heavily on technology for pre-class learning. Unfortunately, not all students have equal access to computers or reliable internet at home. This creates a significant barrier for some of you, making it challenging to engage with the materials and stay on track with the curriculum. Another is the learning environment. Some of the students may not have a conducive environment at home for studying or watching instructional videos. Distractions and a lack of quiet space can hinder our ability to focus and absorb the content effectively
2. *Preparedness for class* - The flipped classroom model places significant responsibility on students to learn independently before class. While this can be empowering, it can also be overwhelming, especially if you struggle with certain concepts or topics. Without direct guidance from the teachers during the initial learning phase, the students may feel unprepared for in-class discussions and activities. Another is the varied learning styles. Each of the students learns differently. Some students thrive in a traditional lecture setting, where they can ask questions in real-time, while others may find it challenging to adapt to the flipped model. This discrepancy can lead to frustration and disengagement among those who do not benefit as much from this approach.
3. *Pressure and accountability* - In-class performance in the flipped classroom often emphasizes active participation during class time. While collaboration is valuable, it can also create pressure to perform well in front of peers. If the students have not fully grasped the material beforehand, they may feel anxious about contributing to group discussions or solving problems on the spot. Moreover, assessment concerns that this new approach may not accurately reflect their understanding or efforts in traditional grading methods. This uncertainty can lead to stress about how our performance will be evaluated and whether it truly represents our knowledge.
4. *Support from teachers and administration* – students may appreciate it when teachers provide clear instructions and offer support throughout the learning process. However, if they are overwhelmed by their workload or lack training in implementing the flipped classroom effectively, it can negatively impact their learning experience. For the flipped classroom approach to work well, there needs to be strong support from our school administration. If resources are limited or there is resistance to change from traditional teaching methods, it can hinder their ability to benefit from this innovative learning fully.

**REFERENCES:**

Abdullah, A. H., & Osman, S. (2020). Effect of peer tutoring strategy on students’ mathematics performance in a polytechnic linear algebra classroom. *Journal of Research in Dynamical & Control Systems, 12*(3). <https://doi.org/10.5373/JARDCS/V12I3/20201209>

Anjomshoaa, H., Ghazizadeh Hashemi, A. H., Jasim Alsadaji, A., Jasim Mohammed, Z., & Masoudi, S.

(2022). The effect of the flipped classroom on student learning outcomes: An overview. *Medical Education Bulletin, 3*(2), 431–440. https://doi.org/10.5267/j.ijdns.2023.9.027

Ariyanti, G., & Santoso F. (2020). The effects of online mathematics learning in the COVID-19 pandemic

Period: A case study of senior high school students at Madiun City, Indonesia. Mathematics Teaching Research Journal, 12(3), 4-11

Avakyan, E. I., & Taylor, D. C. M. (2024). The effect of flipped learning on students’ basic psychological

Needs and its association with self-esteem. *BMC Medical Education, 24*(1), 1127. <https://doi.org/10.1186/s12909-024-06113-7>

Ay, K., & Dağhan, G. (2023). The effect of the flipped learning approach designed with community of inquiry

model to the development of students’ critical thinking strategies and social, teaching and cognitive presences. *Education and Information Technologies, 28*(11), 15267–15299. <https://doi.org/10.1007/s10639-023-11809-2>

Brandon, D. T. (2020). Unflipping the flipped classroom: Balancing for maximum effect in minimum lead-time in online education. *Journal of Chemical Education, 97*(9), 3301–3305. <https://doi.org/10.1021/acs.jchemed.0c00795>

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology,*

*3*(2), 77–101. <https://doi.org/10.1191/1478088706qp063oa>

Campbell, S., Greenwood, M., Prior, S., Shearer, T., Walkem, K., Young, S., Butterfield, M., & Walker, K.

(2020). Purposive sampling: Complex or simple? Research case examples. *Journal of Research in Nursing, 25*(8), 652–661. https://doi.org/10.1177/1744987120927206

Chi, C. (2023, May 3). *Broader, ‘progressive’ draft DepEd curriculum needs longer class hours — ACT*.

Philstar. <https://www.philstar.com/headlines/2023/05/03/2263455/broader-progressive-draft-deped-curriculum-needs-longer-class-hours-act>

Centeno, E., Quimbo, M. A., Lacsamana, M., & Macale, A. (2021). Enhancing the performance of students

in chemistry through flipped classroom with peer instruction teaching strategy. *LUMAT: International Journal on Math, Science and Technology Education*, *9*(1), 717–747. <https://doi.org/10.31129/9.1.1598>

Chikeme, P. C., Ihudiebube-Splendor, C. N., Ogbonnaya, N. P., Mbadugha, C. J., & Elodi, L. O. (2024).

Self-directed learning readiness and learning achievements of a flipped classroom model approach in research methods class: A quasi-experimental study. Nurse Education in Practice, 77, 103968.

Choi, Y., Jakob, S., & Anderson, W. J. (2017). Active learning: Developing self-directed learners through

strong intellectual engagement. *CourseSource*. <https://doi.org/10.24918/cs.2017.20>

Doğan, Y., Batdı, V., & Yaşar, M. D. (2023). Effectiveness of flipped classroom

practices in teaching of science: a mixed research synthesis. Research in Science & Technological Education, 41(1), 393-42. DOI:[10.1080/02635143.2021.1909553](http://dx.doi.org/10.1080/02635143.2021.1909553)

Egara, F. O., & Mosimege, M. (2023). Effect of flipped classroom learning approach on mathematics

achievement and interest among secondary school students. *Education and Information Technologies, 29*(8), 8131–8150. <https://doi.org/10.1007/s10639-023-12145-1>

Hsieh, H.-M., & Maritz, A. (2023). Effects of flipped teaching on entrepreneurship professional students'

learning motivation, self-directed learning, and learning outcome. *Contemporary Educational Technology, 15*(4), ep472. <https://doi.org/10.30935/cedtech/13649>

Hwang, W. Y., Wu, T. H., & Shadiev, R. (2023). Applications of reciprocal teaching in flipped classroom to

facilitate high level of cognition for sustainable learning practices. *Sustainability, 15*(7), 5848. <https://doi.org/10.3390/su15075848>

Kim, C. Y. (2024). The comparison of pre-class learning effect on Thai undergraduates’ academic

performance, speaking self-efficacy, and speaking anxiety in the flipped learning applied Korean classes. *Linguistic Research, 41*. https://doi.org/10.24294/jipd.v8i7.8040

Korkmaz, S., & Mirici, İ. H. (2023). Converting a traditional flipped class into a synchronous online flipped

class during COVID-19: University students’ self-regulation skills and anxiety. *Interactive Learning Environments, 31*(9), 5746–5758. <https://doi.org/10.1080/10494820.2021.2018615>

Lms, E. (2023, November 13). *Flipped classroom vs traditional classroom*. Easy LMS.

<https://www.easy-lms.com/knowledge-center/learning-training/flipped-classroom-vs-traditional-classroom/item10611>

Macale, A. M., Lacsamana, M., Quimbo, M. a. T., & Centeno, E. G. (2021). Enhancing the performance of students in chemistry through flipped classroom with peer instruction teaching strategy. *LUMAT*, *9*(1). <https://doi.org/10.31129/lumat.9.1.1598>

Naik, M. (2023). ASSESSING THE EFFECTIVENESS OF FLIPPED CLASSROOM STRATEGY

ON. European Chemical Bulletin.

Nuevo, M. a. S., & Valdez, G. M. (2024). Future-Proofing mathematics

education: Challenges from the pandemic to coping mechanisms and action planning. *Davao Research Journal*, *15*(4). <https://doi.org/10.59120/drj.v15i4.274>

Nugraheni, M. M. Y., Suryaningrum, P., & Rudito, M. A. (2022). Analysis of the students’

engagement in the process of learning mathematics using a flipped-classroom approach to trigonometry. *Journal of Mathematics and Mathematics Education, 12*(2). <https://doi.org/10.20961/jmme.v12i2.64420>

Pang, Y. (2022). The role of web-based flipped learning in EFL learners' critical thinking and

learner engagement. *Frontiers in Psychology, 13*, 1008257. <https://doi.org/10.3389/fpsyg.2022.1008257>

Pérez‐Sanagustín, M., Sapunar‐Opazo, D., Pérez‐Álvarez, R., Hilliger, I., Bey,

A., Maldonado‐Mahauad, J., & Baier, J. (2021). A MOOC‐based flipped experience: Scaffolding SRL strategies improves learners’ time management and engagement. Computer Applications in Engineering Education, 29(4), 750-768. DOI:[10.1002/cae.22337](http://dx.doi.org/10.1002/cae.22337)

Sánchez, J. C., López-Zapata, D. F., Pinzón, Ó. A., García, A. M., Morales, M. D., & Trujillo, S.

E. (2020). Effect of flipped classroom methodology on the student performance of gastrointestinal and renal physiology entrants and repeaters. *BMC Medical Education, 20*, Article 360. <https://doi.org/10.1186/s12909-020-02329-5>

Sargent, J., & Casey, A. (2020). Flipped learning, pedagogy, and digital technology: Establishing consistent

practice to optimize lesson time. European physical education review, 26(1), 70-84. `` DOI:[10.1177/1356336X19826603](http://dx.doi.org/10.1177/1356336X19826603)

Sapid, M. J., Guarin, C. A., Tibay, D. S., Solon, A., Abalo, K. R., & Cabanilla, A. Jr. (2024). The

lived experiences of “Tara, Basa!” tutors: Challenges and chances. *International Journal of Multidisciplinary Research and Growth Evaluation, 5*(6), 1020–1027.

Shi, Y., Ma, Y., MacLeod, J., & Yang, H. H. (2020). College students' cognitive learning

outcomes in flipped classroom instruction: A meta-analysis of the empirical literature. *Journal of Computers in Education, 7*(1), 79–103. <https://doi.org/10.1007/s40692-019-00142-8>

Smith, K. D. (2021). Is it face time or structure and accountability that matter? Moving from a

flipped to a flipped/hybrid classroom. *Journal of Applied Research in Higher Education, 13*(2), 609–621. https://doi.org/10.1108/JARHE-08-2019-0229

Tian, J. (2023). Integrate Technology into Secondary Mathematics Flipped Classroom. Journal of

Education, Humanities and Social Sciences, 8.

Wei, C., & Huang, F. (2024). A full-flipped classroom mode from the perspective of junior high school

English teachers. *Heliyon, 10*(2). <https://doi.org/10.54097/57717225>

Zheng, B., & Zhang, Y. (2020). Self-regulated learning: The effect on medical student learning outcomes

in a flipped classroom environment. *BMC Medical Education, 20*, 1–7. <https://doi.org/10.1186/s12909-020-02023-6>

Zhou, X. (2023). A conceptual review of the effectiveness of flipped learning in vocational learners’

cognitive skills and emotional states. *Frontiers in Psychology, 13*, 1039025. <https://doi.org/10.3389/fpsyg.2022.1039025>