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Flipping the Script: An Action Research Study on the Impact of the Flipped Classroom Technique on Student Engagement and Critical Thinking in Trinidad

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ABSTRACT

Purpose: The contemporary learning environment is shifting towards innovative, learner-centered pedagogical approaches, such as the flipped classroom, that foster critical and engaged thinkers. This model replaces traditional lectures with pre-recorded online content students peruse before the class to facilitate interactive discussions and collaborative activities during face-to-face sessions. **Methodology:** This study investigated the impact of the flipped classroom on critical thinking and student engagement among six female sociology students at a Trinidadian tertiary institute over one semester. Data was gathered using an action research design utilizing mixed methods collected through classroom observations, student assessments, and student feedback. **Findings:** Post-intervention results demonstrated increased student engagement but no significant improvement in task completion rates. The study also noted a moderate increase in critical thinking skills reflected in students' written assessments but stronger demonstrations during interactive class discussions and group activities in the flipped setting. **Implications:** While the small sample size and subjective nature of this action research limit the generalizability of the findings, the study offers valuable insights into the unique learning context of the participants and highlights the potential benefits of using the flipped classroom model in Trinidadian classrooms.

1. Introduction

Critical thinking (CT) is often touted as a chief goal of noteworthy 21st-century educational institutions and an enigma within teaching and learning. This skill perpetually captivates practitioners like Johnson and Hamby (2015) who call for a 'meta-level approach' when defining CT, while educational researchers like Heard et al. (2020) caution the complex nature of describing and measuring this skill may complicate efforts to cultivate it. Fundamentally, students think critically when they analyze, interpret, and synthesize information to formulate an argument or reach a conclusion through personal autonomy and independent thought.

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Some researchers underscore the importance of student engagement (SE) in fostering CT as they describe students with CT skills as self-directed learners who fully engage with course material. For instance, Gray and DiLoerto (2016) posit that enthusiasm and willing participation are crucial for learning, content retention, and formulating individual opinions. Similarly, Hickey and Sherman (2013) note CT is best promoted through interaction and decreased learner isolation via active learning opportunities, collaborative work, and increased positive experiences.

The literature suggests improving SE via the Flipped Classroom (FC) method can enhance CT. This technique inverts traditional forms of instruction to produce a more collaborative and active learning environment by introducing students to class content for individual review at home via an online platform and then utilizing class time for discussion and interaction.

1.1. Rationale

Observations revealed some students are less active in the lesson than others. This is problematic since limited interaction makes it difficult for the teacher to assess students' understanding as the lessons progress. Thus, this issue catalyzed the current action research because it is important for teachers to explore the reasons for student disengagement and address this issue. Further, teachers must be reflective practitioners who can respond to classroom issues and boost SE while achieving learning outcomes.

It is crucial to investigate methods for improving CT and SE since a fundamental objective of global and regional educational systems is to produce well-informed, analytical, and engaged learners who can contribute to society's holistic development. For instance, in 2020 the Education International Executive Board emphasized that CT must be developed among students and efforts should be made to fully immerse them into the lessons. Moreover, the Caribbean Development Bank's 51st Annual Meeting of its Board of Governors insisted that Caribbean education systems should make a greater effort to nurture CT to enhance regional innovation. Similarly, the Draft Education Policy Paper 2017 – 2022 collated by Trinidad and Tobago's Ministry of Education, adopted UNESCO's Pillars of Learning and Attendant Foundations to guide the administration of the country's education systems. The second pillar addresses human and social development and pinpoints CT as one facet of quality education so it is important that exploration of methods to nurture this skill in Trinidadian classrooms especially since past Education Minister, Mr. Anthony Garcia, noted a dearth of CT among local students (Dowrich-Phillips, 2017). Accordingly, enhancing students' CT skills and student engagement appears to be an essential feature of global, regional, and local educational sectors and therefore necessitates research that uncovers ways of teaching students how to think, rather than what to think.

Researchers like Reyna (2015) advise that active learning is best achieved via the Flipped Classroom (FC) technique since this learner-centered approach encourages students to seize ownership of their learning and demonstrate their understanding and may, therefore, be a suitable intervention for addressing the limited CT and SE observed among students. Furthermore, Sulisworo et al. (2019) previously confirmed the effectiveness of flipped classrooms among Indonesian Physics students in a blended learning setting, and Yulian (2021) established their successes in improving Indonesian university students' CT in an online English class. Hence, it is worth investigating the value of this method for improving CT in a Trinidadian tertiary classroom, especially since this skill is important for developing other aptitudes beneficial in university environments such as problem-solving and analysis.

1.2. Significance of the Study

The results of this AR into the effectiveness of the FC in improving students' CT skills promise to be beneficial to various regional and local education stakeholders. For instance, the findings can reveal whether the FC promotes meaningful learning experiences and enhances SE, and ascertain the suitability of this student-centered approach to Caribbean learners. Thus, regional educational ministries may be inspired to suggest this technique as a possible curriculum delivery method.

Locally, the Ministry of Education intends to provide a school climate that fosters peak student performance and encourages a love of learning (Ministry of Education, Draft Education Policy Paper, 2017-2022). Hence, this body may be interested in discovering how the FC model can contribute toward the development of CT skills among Trinidadian students and therefore find value in the findings of this paper.

Additionally, an overwhelming amount of published literature on CT and SE concentrates on extra-regional societies, so the current study will address the deficiency of academic works on the success of the FC on Caribbean populations and illuminate methods to improve CT among local students. Its findings can enlighten Trinidadian practitioners about the benefits of employing different teaching strategies and inspire them to incorporate learner-centered approaches that produce critical thinkers interested in the lesson and possibly simultaneously curtail attrition rates.

1.3. Purpose and Context of the Study

The purpose of this research is to investigate whether implementing the flipped classroom model as a student-centered approach to learning will increase the engagement and critical thinking among the researcher's class of Sociology students at a tertiary institution in Trinidad. Participants in this action research were teachers and trainees in Early Childhood education enrolled in a two-year part-time programme that covers early education theories, culture, and the social and historical aspects that influence pedagogical practices and Trinidadian and Tobagonian society. This study sought to answer the following research questions:

1. How effective is the flipped classroom in improving the critical thinking skills of Sociology students in a tertiary classroom?
2. To what extent does the flipped classroom improve Sociology students' engagement in a tertiary classroom?

2. Literature Review

2.1. Understanding Critical Thinking (CT)

Murawski (2014) defines CT as the intellectual procedure of conceptualizing, analyzing, and evaluating information to arrive at new understandings. Hence, critical thinkers use their pre-existing knowledge to carefully analyze information, make inferences, and demonstrate interpretive, creative, and evaluative capabilities. Researchers insist on the key role played by teachers in improving students' CT, especially through strategies like higher-order questioning to encourage independent thought (Amin, 2021) which encourages students to consider what they learned, apply their knowledge, and provide a rational response. Additionally, he suggests that allowing students to first think on their own, and then cooperate during group work allows them to engage in discussion and idea sharing, and ultimately expand their thinking. Arguably, CT may be best cultivated in student-centered

learning environments that place the responsibility for learning in pupils' hands and shift focus from the teacher to the learner, as is the case in a flipped classroom (FC).

2.2. Exploring Critical Thinking via Action Research in a Flipped Classroom

This pedagogical strategy reverses traditional direct instruction and creates more engaging learner-centered lessons (van Alten et al. 2019). Class content in the form of pre-recorded lectures, podcasts, notes, and videos is shared with students beforehand, enabling their review of the material at a pace, time, and place better prepares them for class participation. Hence, class time is prioritized for active learning through teacher-guided discussions and collaborative and problem-solving activities.

Previous investigations established positive impacts of this FC technique on learners' CT. For instance, Dusenbury's 2016 study found that flipped learning increased the open-mindedness, course satisfaction, and CT abilities of 81 undergraduate college students, while Alsowat (2016) uncovered significant relationships between higher-order thinking skills and satisfaction among English students in a graduate-level FC. In contrast, other scholars like Van Alten (2019) caution students lacking self-regulation may experience difficulties with the self-directed learning requirements of the FC, while Sirakaya and Özdemir (2018) note the FC works best with motivated, self-directed students.

2.3. Understanding Student Engagement (SE)

SE can be broadly defined as the extent to which students become engrossed in their studies and take ownership of their learning. Contributions by engaged students surpass simple repetition of facts and encompass persistence and passion for learning (Abla & Fraumeni, 2019). Engaged students are attentive and curious, fully devoted to their scholarship, and motivated to participate in lessons. Martin et al. (2016) linked class participation and students' self-directed collaboration with high achievement and low attrition rates in Jamaica, while a Trinidadian study by Jaggernauth and Lochan (2021) identified low academic achievement and SE in learning mathematics and addressed these deficiencies through non-digital learning games.

2.4. Exploring Student Engagement via Action Research in a Flipped Classroom

Another method used by practitioners to boost SE is the intervention of choice for the current action research - the flipped classroom (FC), as Khodaei et. al. (2022) found the FC boots engagement among pupils who become active rather than inactive as teachers act as supporters rather than leaders. It is possible that the self-regulating nature of this model can foster independent learning skills among students by allowing them to process material without the teacher and ultimately refine their intellectual and intrapersonal skills as they demonstrate their knowledge among peers.

Several researchers have conducted action research studies into the successes of the FC in improving SE. One important study completed by Smallhorn (2017) found this model enhanced classroom engagement and student autonomy among 600 Australian sophomores. Similarly, students from Clark's 2015 study increased their engagement and communication after exposure to an FC and described the process as 'refreshing,' 'hands-on,' and 'exciting' (Clark, 2015: 103).

3. Methodology

3.1. Research Design

Action research (AR) was used to investigate the impact of the flipped classroom technique on student engagement and critical thinking among students in the researcher's Sociology class. Brown et al. (2015) describe action research as a systematic method of classroom inquiry undertaken by educators for professional learning and reflection. Previous AR conducted by Smallhorn (2017) and Sun (2017) via quantitative (surveys and attendance records) and qualitative methods (reflective journaling) found SE increased in FC settings. Consequently, this technique was deemed appropriate for investigating the impact of the FC method on students' CT and engagement in the researcher's classroom. A similar mixed-method approach was utilized to collect data over the six-week course duration. The study's participants comprised a single class of six female Sociology students at one tertiary institution in the Port of Spain educational district. The students were enrolled in the course for one semester and attended twelve three-hour-long face-to-face sessions.

The conventional lecture method was initially utilized for the first six sessions (three weeks) to deliver course content to students during each session. The teacher presented information to the students by speaking, explaining concepts, and leading the discussions for most of the class while students took notes, listened, and responded to questions posed. The flow of classroom conversations was directed by the teacher who steered the dialogues and guided students through several in-class learning activities. The week-by-week breakdown before flipping the classroom is as follows:

Week 1: Students received lecture notes on Sociological perspectives during class and watched a YouTube video explaining Functionalism. They participated in lecturer-led discussions on the perspectives and completed a worksheet comparing micro and macro sociological theories at the end of the class.

Week 2: Class materials included a PowerPoint presentation on social stratification delivered by the lecturer and printed newspaper articles on inequality in education. In-class activities included group discussions on each newspaper article and pair brainstorming sessions on factors contributing to educational inequalities in Trinidad.

Week 3: The lecturer delivered lecture notes and digital resources on Education in class using PowerPoint slides and explained them. Students took notes and participated in an online quiz as an 'exit ticket' to recap the content from the past three weeks.

The classroom was flipped for the remaining six sessions (three weeks) by presenting students with weekly lecture notes, video links, and short articles on the course's Microsoft Teams online workspace before each face-to-face session. These materials included summarized lecture notes on Sociological perspectives on the family and associated concepts, YouTube videos, such as a video illustrating gender socialization, local online newspaper articles on deviance and coverage of school violence, and digital worksheets on culture and national icons. The lecturer provided guided questions to help students understand the uploaded resources and 5-question structured quizzes for formative learning. The week-by-week breakdown of the flipped sessions is as follows:

Week 4: Students were introduced to the flipped classroom model. Resources uploaded on Microsoft Teams included summarized notes on sociological perspectives of the family, a YouTube video on gender socialization, and a reflective worksheet. Students read the material and completed a short quiz to assess initial understanding at home. In class, students

discussed the sociological perspectives on the family in small groups and taught each other the different family structures in Trinidad and Tobago using the jigsaw method.

Week 5: Online resources focused on deviance. Newspaper articles about school violence and a digital worksheet on deviant behaviour, which included questions on the newspaper articles, were uploaded to Microsoft Teams. Students analyzed the articles and completed the worksheet independently before class. In class, they engaged in a role-play activity simulating societal reactions to deviance, followed by group discussions comparing and contrasting crime and deviance. Three student volunteers wrote key points from this discussion on the board, and this became their notes for the session.

Week 6: The lecturer uploaded materials, including biographies and historical accounts of 6 national icons and students used this material to prepare and deliver individual presentations on an icon of their choice. Notes and online resources on environmental hazards, including hurricanes, volcanoes, earthquakes, and tsunamis were also uploaded. In class, students delivered their presentations and participated in Q&A sessions with peers. They then delivered pair presentations on environmental hazards and their socioeconomic impacts. The pair presentations were prepared before class using uploaded class materials, and delivered in a teaching format, allowing students to take on the role of teachers. During these presentations, they engaged their classmates with learning activities, including worksheet completion and question-and-answer segments to reinforce the content.

Student presentations were assessed using a rubric focusing on the following four key areas:

- **Content Mastery (10 marks):** Depth of research and accuracy of information presented.
- **Presentation Skills (5 marks):** Clarity, confidence, and engagement during delivery.
- **Creativity and Engagement (5 marks):** Use of innovative teaching aids, interactive activities, and the ability to engage classmates.
- **Critical Thinking (5 marks):** Ability to analyze and synthesize information, and respond to questions.

The lecturer evaluated student-led activities (presentations, discussions, worksheets, and other handouts prepared by students) based on their relevance in reinforcing key concepts. Peer feedback was another integral component of this evaluation, as students identified strengths and weaknesses of each other's presentations and supported resources after each presentation.

The lecturer's role shifted to a facilitator by providing guidance when needed, encouraging students to analyze and discuss the content critically, and posing probing questions to help deepen their understanding. Some guided questions included, "Are traditional gender norms restrictive to men and women?" "Imagine if there were no laws in our country. How would we distinguish right from wrong and ensure social order?" "Why are poor people more adversely affected by natural disasters than affluent members of society?

3.2. Data Collection Methods and Instruments

Data were collected via a mixed methods approach using quantitative methods to measure critical thinking and qualitative techniques to assess student engagement. Rickles et al. (2013) successfully used the Structure of Observed Learning Outcome (SOLO) taxonomy to assess the levels of critical thinking quantitatively demonstrated in students' Sociology essays. They measured students' ability to synthesize information, use sociological concepts to analyze issues, and draw conclusions by following the rubric and assigning an appropriate mark out of a possible 5 marks (Table 1). Hence, this tool and an essay rubric guided by

Bloom's taxonomy were used to allocate a score out of 25 to two homework essays, each assigned before and after implementing the flipped classroom. The categories of the rubric included knowledge and understanding (7 marks), application and analysis (10 marks), and synthesis and evaluation (8 marks). The mean scores were compared for variations in critical thinking between the pre- and post-intervention periods.

Table 1.
SOLO Taxonomy

Classification	Description	Marks
Prestructural	No understanding demonstrated. Response restates theories or does not use theory to answer the question	1 mark
Unistructural	Limited understanding. Response focuses upon part of the question.	2 marks
Multistructural	Demonstrates an understanding of several components. Response includes different perspectives but does not fully develop points.	3 marks
Relational	Demonstrates an understanding of several components. Response integrates theory into the answer and uses supporting evidence.	4 marks
Extended abstract	Demonstrates superior understanding of theory and what is asked in the question. Response integrates theory using supporting evidence and offers substantial critique of the perspectives.	5 marks

Note: Adapted from Rickles et. al. (2013).

Researchers like Brown et al. (2015) and Sun (2017) successfully explored student engagement using the qualitative method of teacher journaling to note classroom observations. Thus, the researcher completed the journaling observation sheets developed by Anjarwati and Sa'adah (2021) twice during each flipped classroom session, first at the halfway point, when most students were actively engaging with peers or presenting their material, then at the end of the session during the last 15 minutes, when students were completing activities or wrapping up group discussions.

These observation sheets were structured to note students' key engagement behaviours detected by the lecturer during the flipped classes, including student participation in discussions and peer-to-peer interactions and engagement indicators such as student attentiveness, enthusiasm, voluntary participation, and task completion. Each category included prompts to guide observations, such as "How often did students offer their opinions?" and "Describe students' body language, e.g., are students making eye contact with the speaker?" The complete template detailing all categories and prompts is provided in Appendix A for reference. Qualitative data from the observation sheets were analyzed using a thematic coding approach. Observations were categorized into the following themes: Active Participation, Collaboration, and Critical Engagement. To ensure the reliability and validity of the observational data, the researcher completed the observation sheets during each session to minimize recall bias and ensure that observations were accurately recorded.

4. Discussion of Findings

4.1. Critical Thinking

Following the implementation of the flipped classroom approach, this research revealed that students exhibited a notable capacity to synthesize and evaluate information effectively in group settings. Conversely, a significant challenge arose when these students were required to apply these skills in the context of individual written assessments. Though all students passed the course and demonstrated satisfactory levels of critical thinking, they encountered

difficulties autonomously applying and articulating these evaluative skills in a cohesive written format.

4.1.1. Scoring Critical Thinking

Before the intervention, students predominantly scored in the unistructural and multistructural criteria of the SOLO taxonomy, indicating a basic understanding of the examined Sociological concepts but lacking depth in their analyses. The essays employed relevant key phrases of the discipline and accompanying definitions and reflected proficiency in the knowledge and understanding component of the rubric, yet their application and synthesis scores were notably low.

The implementation of the FC technique resulted in a marginal improvement in students' critical thinking skills, as evidenced by more detailed final essays and attempts to connect various aspects of the examined concept. Despite this, no student reached the 'extended abstract' category of the SOLO taxonomy, as they did not adequately apply their knowledge of the Sociological theories to evaluate their relevance to the contemporary Caribbean – though this was a stated instruction for their final essay. Students' application and synthesis scores remained low since their responses contained limited integration of examples from the Caribbean despite explicit instructions to reference the Caribbean society. Additionally, their essays demonstrated challenges in organizing thoughts cohesively, and their arguments were fragmented and presented surface-level evaluations of the theories. This shortfall suggests that while students could verbally critique and synthesize information during class and in collaboration with classmates, they struggled to express these insights in their written work.

Thus, the sustained high scores in the knowledge and understanding component of the rubric, coupled with the improved analysis, did not translate into higher marks in the synthesis category even after the intervention (Table 2). So, the higher-order thinking skills found by Alsowat (2016) were not replicated in this study. These gaps highlight a need for strategies to help students transfer their verbal critical thinking skills more effectively to written assessments. One suggestion is to incorporate scaffolding exercises into in-class writing tasks, while another is to introduce peer review and feedback sessions to allow students to evaluate each other's written work. Peer evaluation sessions were only used after oral presentations, and while this helped students refine their verbal expression, it did not allow them to develop written skills. Also, specific sessions can be dedicated to teaching effective writing strategies, such as structuring arguments, using evidence, and connecting ideas cohesively.

Table 2.
Mean scores attained by all six students on the essay rubric pre- and post-intervention

Category	Pre-intervention mean	Post-intervention mean	Total possible score
Knowledge and understanding	5.86	6.86	8
Application and analysis	5.86	6.34	10
Synthesis and evaluation	3.14	3.14	7

One possible explanation could be that students may experience heightened pressure when their work is solely individual, consequently impacting their capacity to effectively synthesize and express ideas since they may have grown accustomed to relying on others to fill knowledge gaps in the group setting. This is probably why Van Alten (2019) and

Sirakaya and Özdemir (2018) noted that the FC is most successful among motivated, self-directed learners.

Interestingly, it was observed that students demonstrated a heightened ability to synthesize and evaluate information verbally during classroom sessions and consequently demonstrated critical thinking according to Murawski's 2014 position that critical thinking is marked by the academic procedure of analyzing and evaluating information. For instance, when discussing gender socialization with her classmates, one student used an example from one of the online video resources on cultural norms to support her classmate's anecdotal references, thereby demonstrating her ability to evaluate sociological concepts in real-world contexts and connect course content to class discussions. However, this proficiency did not consistently manifest in students' written work, as previously stated, especially in this student's essay. One potential reason for this discrepancy may be that students may have felt more confident expressing ideas verbally, especially since they could have built on each other's thoughts and put forward a collaborative response. In contrast, writing exercises are more solitary and require greater organization and structuring of thoughts independently, which may be more challenging for students.

Evaluative learning mainly occurred during group activities or pair assignments, indicating that students were more adept at synthesizing information while collaborating. This observation suggests that while students may benefit more from group learning environments – where the exchange of ideas and collaborative efforts contributed to enhanced synthesis and evaluation skills – these activities focused more on verbal communication and discussion, leaving students with limited practice in expressing their thoughts coherently in written form.

This challenge in translating these critical thinking skills to individual written assessments may be addressed by incorporating more written formative assignments into flipped modalities so students can refine and practice their writing and gradually improve their ability to translate ideas onto paper effectively. By aligning verbal and written tasks more closely and providing ample practice opportunities, students can gradually develop the skills needed to express their critical thinking effectively in written form.

4.2. Student Engagement

Student engagement significantly improved following the implementation of the flipped classroom (FC) intervention as all students became more deeply involved in the learning process and displayed a heightened sense of readiness and preparation. Though attendance was consistent before the flipped modality, and did not increase during the intervention, students' active participation in discussions improved as they were more engaged during the flipped sessions.

4.2.1. Interactions with the Researcher and Classmates

One of the most notable outcomes of the FC was the increase in teacher-student interactions as even the quietest student began sharing opinions and asking questions. This shift may have resulted from integrating in-class activities that extended upon the pre-class material, fostering independent preparation followed by collaborative sharing. For example, during specific sessions, students were tasked with preparing impromptu brief presentations on assigned topics and delivering them during class. In this instance, the reserved student became animated as she delivered a presentation that surprised her peers and the lecturer by speaking confidently and loudly, effectively fielding questions from her classmates, and demonstrating thorough knowledge about her national icon. Her tone and body language made it clear that she enjoyed this activity and was delighted to share her knowledge of the

chosen icon. This approach encouraged greater student engagement, as each individual was accountable for their respective topic. Consequently, even the more reserved student was compelled to participate actively in the sharing process hence, the findings of Khodaei et. al. (2022) t that described pupils in an FC as active rather than inactive apply to this study.

4.2.2. Students' Discussions

Secondly, student engagement was evident through active listening to the teacher and peers and students' interest in discussions, commenting and asking follow-up questions. While initial attentiveness varied among students at the beginning of the semester, the researcher observed a steady increase in attentiveness across all students as the semester advanced. Markedly, answering questions and responding to the opinions of other students tended to be dominated by certain students before the intervention but more students actively contributed in the flipped setting.

The researcher also documented the genuine interest and enthusiasm expressed by students, particularly concerning the history topic. For instance, during a discussion on historical processes, students showed heightened engagement when one peer explained how slavery continues to impact modern Caribbean culture and notions of racism. Several students nodded in agreement, some added personal insights, while others posed follow-up questions about the implications of colour discrimination on contemporary society. This level of interaction was noticeably different from previous, more passive discussions. Students admittedly had not fully grasped the impact of slavery on today's Caribbean until this flipped session and now showcased a fresh understanding and enthusiasm for the subject matter. This is important since they are teachers in training and will soon be responsible for teaching these same topics to students under their tutelage.

4.2.3. Peer-to-Peer Questioning

Moreover, it was noted that the flipped model stimulated increased interaction among students through activities including group discussions and preparation for in-class group presentations. These activities compelled students to assume the roles of peer educators and enhanced their autonomy as previously discussed by Smallhorn (2017). Specifically, students were tasked with presenting information about a national icon of their choice. This exercise facilitated the sharing of perspectives, encouraged the exchange of information among peers, and placed the responsibility on students to research and explain concepts to each other. A notable observation was made during one of these sessions when students were visibly surprised by the information presented by the most reserved student in the class. They actively posed questions to this student, who responded effectively hence the FC technique also promoted peer-to-peer sharing and interactions. Thus, students became more active participants in their learning rather than passive recipients of information.

4.2.4. Task Completion

Task completion serves as a tangible and reliable measure of student engagement that showcases dedication to learning, willingness to fulfill and submit assignments, and overall comprehension of the taught material. In the context of the researcher's small class, all students consistently submitted their coursework assessments punctually even prior to the implementation of the intervention, suggesting that the flipped technique did not adversely impact task completion. During the pair presentation on the socioeconomic impacts of a hurricane, the team exceeded minimum PowerPoint delivery expectations by creating a visual timeline on a handout for their classmates. This extra effort showed their dedication to the task and highlighted the students' ongoing engagement throughout the flipped sessions.

Notably, assessments were not hastily completed as students surpassed the minimum requirements for their pair presentations in the final week of the course. Though the FC may have not directly improved task completion, this model may have been responsible for maintaining students' enthusiasm throughout the course especially since earlier research by Clark (2015) noted increased excitement among students in a FC.

4.3. Recommendations

Two of the major findings of this study were that, although previous researchers observed increased critical thinking skills in written assessments and improvements in students' higher-order evaluative skills, these results were not replicated in the current investigation. The following recommendations are proposed as possible methods for addressing these discrepancies:

1. Frequent formative written assignments can be integrated into the flipped classroom model to bridge the gap between verbal and written demonstrations of students' critical thinking. One suggestion is to encourage a mini de-brief essay exercise at the end of each session so students can summarize the lesson and evaluate one point discussed.
2. Incorporate written prompts at different points throughout a lesson to move students beyond recalling information to evaluating the material and practicing higher-order thinking. For instance, instead of asking them to state verbally the reasons for inequality in education, they could be asked to write a paragraph response on the effectiveness of the local education system in reducing social inequalities. One strategy that can immediately be adopted to improve the effectiveness of the flipped classroom model is incorporating written prompts throughout the lesson to help students transition from information recall to higher-order thinking.

To ensure sustainable improvements and measure the success of the flipped classroom approach, institutions should adopt the following long-term plans:

1. Develop a structured curriculum that embeds critical thinking exercises and written assessments throughout the course. These exercises should be aligned with learning objectives to ensure consistent development of higher-order thinking skills.
2. Conduct semesterly evaluations of the flipped classroom model using qualitative (e.g., student focus groups) and quantitative (e.g., surveys) methods. Additionally, pre- and post-tests evaluating written and verbal critical thinking skills should be conducted to measure improvements in students' critical thinking and engagement after each semester.

Implementing the flipped classroom model across campuses requires the professional development of educators, who must be trained in effectively designing and delivering flipped classroom activities. Thus, institutions can consider hosting workshops on creating engaging flipped classroom activities and encourage faculty to share best practices through teaching circles. However, this requires institutional support so campuses can ensure that a dedicated committee comprising faculty members is formed to research, curate, and develop high-quality flipped classroom activities.

4.4. Limitations of the Current Study and Opportunities for Future Research

While this action research (AR) was time-consuming, subjective, and yielded non-generalizable results, it provided a practical method for the researcher to enhance their practices, assess their approaches, and generate knowledge about students in their classroom.

The subjective nature of AR is rooted in practitioner reflection and self-logged observations, which were often difficult to complete while teaching and moderating in-class activities, but the inclusion of standardized measures such as the SESQ and analytic rubric contributed objectivity and empiricism to the present research and an effective method for measuring critical thinking.

Still, the qualitative approach and limited sample size in this AR study hindered the generalizability of these findings to other student cohorts or schools, confining conclusions to the specific group under investigation. Furthermore, the exclusive female student sample meant that the male perspective was not represented, and this limitation can introduce bias and limit the generalizability and comprehensive understanding of the study's results. Interestingly, the incapacity to make broad generalizations from this AR can be identified as an opportunity, as it allows for insights tailored to the specific learning needs of the examined group of students and those pursuing this course of study at this institution.

5. Conclusion

In summary, this action research delved into the effects of an FC intervention on enhancing SE and CT within a small group of female Sociology students. The findings underscored a notable increase in SE during the flipped modality possibly due to the student-centered interactive nature of this approach. Moreover, a modest improvement in CT skills was observed, particularly evident during in-class group presentations and pair activities. The research also discovered more prominent manifestations of students' CT in oral formats, indicating the positive impact of collaborative verbal exchanges on students' communicative and critical abilities. However, the limited emphasis on written activities during the flipped modality may have contributed to a weaker demonstration of CT in independent written assessments.

Therefore, this research has broader implications for tertiary education providers across Trinidad and the wider Caribbean, especially since developing 21st-century skills like critical thinking and problem-solving, have become more emphasized. The findings suggest that integrating flipped classrooms in tertiary settings could foster more engaged and participatory learning environments, which may be especially beneficial in the Caribbean region, where traditional lecture-based approaches remain prevalent. For educators, this study highlights the importance of incorporating both verbal and written assessments in FC models to ensure comprehensive skill development.

Furthermore, given the challenges some students face in applying CT skills independently, tertiary institutions in Trinidad and the Caribbean might consider providing additional support and resources to guide students in transitioning from group-based learning to autonomous application of knowledge. This could include workshops on academic writing and critical analysis or integrating self-assessment tools into the curriculum.

While the flipped classroom approach demonstrated its potential to enhance verbal critical thinking through collaborative learning, its effectiveness in improving written critical thinking remains an area for growth. This AR highlights the importance of considering diverse assessment methods within the flipped classroom framework and can encourage future research into the dynamics of CT and SE within flipped Caribbean tertiary classrooms.

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Appendix A

Observation Sheet Template

Date: _____
Session Number: _____
Topic of Session: _____
Observer Name: _____
Observation Timing:

- ☐ **Mid-Session**
- ☐ **End of Session**

Behaviour	**Indicator**	**Description**	**Notes/ Observations**
Participation in discussions	Frequency of contributions	Number of times students voluntarily offer opinions	
	Quality of contributions	Are students providing detailed answers?	
	Peer-to-peer interactions	Do students engage with each other's ideas?	
Student attentiveness	Body language	Ask Stevens making eye contact or showing interest in the speaker?	
	Distractions	Are students distracted by phones or side conversations?	
Enthusiasm	Energy level	Do students show excitement or enthusiasm?	
	Voluntary participation	How many students volunteer for roles?	
Task completion	On time completion	Do students finish assigned activities within given timeframe?	
	Quality of work	Is the work thorough?	

Guiding Prompts for Observer Notes
Participation in Discussions

1. How often did students offer their opinions?
2. Did students respond to peer comments or questions? Provide examples.

Student Attentiveness

3. What behaviors indicated attentiveness (e.g., eye contact, note-taking)?
4. Were there any noticeable distractions? Describe.

Enthusiasm

5. Did students show interest in the topic? How?
6. Were there moments of high engagement or excitement? Describe.

Task Completion

7. Were activities completed on time and with quality?
8. Did students require additional help from the instructor or peers?