

## The Impact of Flipped Classroom Models on Student Engagement and Critical Thinking in High School Social Studies

<sup>1</sup>Dr. Ankush Sharma, <sup>2</sup>Dr. Mousam Singh, <sup>3</sup>Dr. Naresh Kumar, <sup>4</sup>Dr. Sanjeev Vijay

<sup>1</sup>Professor, Jagannath University, Jaipur

<sup>2</sup>Associate Professor, Jagannath University, Bahadurgarh

<sup>3</sup>Associate Professor, Jagannath University, Bahadurgarh

<sup>4</sup>Associate Professor, Jagannath University Jaipur

### Abstract

The flipped classroom model has received considerable attention as a learner-centered instructional model that shifts the delivery of direct instruction to before-class learning activities and classroom time to collaborative, higher-order learning activities. Some evidence exists of positive impact on student engagement and critical thinking, but the evidence is inconsistent across subject areas, especially in high school social studies. This study aims to explore the effect of the implementation of the flipped classroom on the behavioral, emotional, cognitive engagement, and disciplinary critical thinking of secondary-level social studies students. This study uses a quasi-experimental mixed-methods design that compares matched flipped and traditional classes over one term. Data were collected using validated engagement surveys and validated discipline-specific critical thinking performance tasks and analyzed using both ANCOVA and mediation modeling. Classroom observation and students' interview data were analyzed qualitatively using thematic analysis to gain insights into learning processes and mechanisms. Results showed that, after accounting for students' prior achievement, critical thinking levels across the cognitive domain were significantly higher for those in the flipped classrooms than for those in the traditional classrooms. The relationship between the instructional model and critical thinking outcomes was mediated in part by cognitive engagement. The study is an important contribution to the research of flipped learning because it places the results of the flipped learning in the context of the social studies classroom, and it uses the theory of engagement and cognitive learning outcomes. Instructional design and teacher professional development implications, as well as secondary education policy implications, are discussed.

**Keywords:** Flipped classroom, student engagement, critical thinking, social studies education, secondary education

### Introduction

Secondary education systems around the world are increasingly being pushed to develop students who can think critically, make informed judgements and have the ability to reason about civic issues. This is particularly stark in high school social studies, which is responsible for developing the ability to read, critically analyze, and understand complex social problems and issues, and to weigh and consider multiple viewpoints and positions so that students can have an impactful presence in a democratic society. Although content-focused instruction through a traditional lecture method is effective, it has come under increasing scrutiny as a method that provides little opportunity for students to engage actively or think at higher levels in social studies classrooms (Darling Hammond et al., 2020). As a countermeasure, teachers have started investigating teaching models that shift students' role in learning from being a consumer to that of a producer. Of these, the flipped classroom Model has become a prominent

alternative. The flipped classroom is an approach that flips the traditional classroom model so that students are introduced to the content outside of class through a teacher-made video or other digital resources, and then engage with discussion, problem solving, and collaborative inquiry in class (Bergmann & Sams, 2012). These are thought to deepen engagement and increase prolonged focus during class, especially with good design of active learning activities (Bishop & Verleger, 2013). Although evidence for positive results is present in all STEM disciplines, in subjects that rely more heavily on humanities, such as social studies, there is a more limited and disjointed body of evidence.

Student engagement is one of the pathways by which it is believed flipped learning impacts learning outcomes. Student engagement is believed to be one of the pathways in which flipped learning impacts learning outcomes. Engagement is typically viewed as a multi-dimensional construct comprising of behavioral involvement, emotional involvement, and cognitive involvement (Fredricks et al., 2004). Social studies learning, in which there is sometimes a strong element of interpretive reasoning and/or value-laden discussion, may be especially sensitive to shifts in cognitive and affective involvement stimulated by instructional design. Many existing studies of flipped classrooms, however, use scales of perceived satisfaction or course grades as indications of the effects of the flipping model, which lacks fine-grained information about the effects on particular components of engagement in SS education in secondary schools. Another critical outcome is closely related; namely, critical thinking. The social studies have many skills that are emphasized and align with contemporary notions of disciplinary critical thinking as described by Wineburg (2018) previously mentioned, including: sourcing, corroboration, argumentation, and evidence-based reasoning. While flipped classrooms have been associated with higher-order thinking, there are mixed results in the literature and limited studies that explicitly address the mediation between flipped classrooms and higher-order thinking for high school students. To make up for these shortcomings, the study is conducted to explore the effect of the FL model on student participation and critical thinking in SS learning in high schools. It is based on constructivist learning theory, which has been studied and applied in cognitive engagement, with a quasi-experimental mixed methods design that compares the flipped classroom with the traditional classroom in matched classes. The study uses validated instruments for engagement, as well as discipline-specific critical thinking instruments and qualitative information gathered in the classroom, in order to delve deeper into the impact of flipped instruction on student learning, rather than making superficial comparisons.

The following research questions and hypotheses guide the study:

- RQ1: Does participation in a flipped classroom increase behavioral, emotional, and cognitive engagement among high school social studies students compared with traditional instruction?
  - RQ2: Does the flipped classroom model produce greater gains in disciplinary critical thinking skills than traditional instruction?
1. H1: Students in flipped classrooms will demonstrate significantly higher posttest critical thinking scores than matched peers in traditional classrooms, controlling for pretest performance.
  2. H2: Cognitive engagement will mediate the relationship between flipped classroom participation and critical thinking gains.

This study makes three primary contributions. First, it extends flipped classroom research into high school social studies, a domain that has received limited empirical attention relative to STEM fields. Second, it advances theoretical understanding by explicitly testing engagement as a mediating mechanism linking instructional design and critical thinking outcomes. Third, it offers evidence-based implications for educators and policymakers seeking to align instructional practices with broader civic and analytical goals of secondary education.

## Literature Review

### **Flipped Classroom Models in Secondary Education.**

The flipped class method was born from the negative experiences with passive learning and low degree of interaction in the classroom in the conventional teaching model. Early conceptions focused on shifting the delivery of lecture-based content to the pre-class space (pre-class, typically via video lectures, or digital readings) to leave more class time for application, discussion, and feedback (Bergmann & Sams, 2012). Later research narrowed the definition of flipping to homework that takes the form of video, but also explored it as a paradigm shift in learning to be more active and centered on students (Abeysekera & Dawson, 2015). Flipped classrooms in secondary education have been introduced in various disciplines such as mathematics, science, language arts, social studies, and others. The results of the meta-analysis indicated that there was moderate but positive evidence that flipped instruction had an impact on student achievement relative to traditional instruction, especially if the in-class activities are connected to higher-order learning objectives (Lo et al., 2017; van Alten et al., 2019). These effects are, however, widely different across content areas, instructional quality, and learner characteristics, however, and highlight the need for content-specific investigation.

The implementation of flipping teaching in high school has its own characteristics. This is because there are distinctions between the self-regulation capacity, motivation and access to learning resources of adolescents and university students, which impact on their engagement with the pre-class materials (Kong, 2014). Research at the secondary level showed that the structured guidance, accountability system, and clear links between pre class and in class learning were the most critical elements for the success of flipping (Chen et al., 2018). If not, some learners may experience a cognitive overload or be exposed to inequities in flipped instruction without supports. Though flipped classrooms have been increasingly adopted, there are still relatively few empirical studies on flipped classroom in high school social studies. Most of the previous research is limited in scope, descriptive, and/or limited attention to students' perceptions and not to learning processes or outcomes (He et al., 2016). Therefore, the ways in which flipping can affect engagement and critical thinking in this field are not fully understood.

### **Student engagement as a Multidimensional Construct:**

Engagement with learning has been identified as one of the key factors determining learning success, persistence and deep learning. Modern models of engagement view it as a multifaceted phenomenon that includes the behavioral, emotional, and cognitive aspects (Fredricks et al., 2004). Behavioral engagement is manifested through observable involvement in learning activities, emotional involvement in learning indicates interest and affective reaction, while cognitive engagement is concerned with the effort needed to strategically approach learning, self-regulation, and investment in complex learning activities. Engagement is especially important in the study of social science because of the interpretive and dialogic nature of the

discipline. It has been found that students learn better when instruction uses an inquiry, discussion, and real world approach (Kahne et al., 2016). In contrast, classrooms where a lecture is used have been linked to superficial involvement and few opportunities for extended thinking. It is thought that flipping the classroom will improve engagement by allowing time in the classroom for interactive learning and problem solving in groups. This is supported to a limited degree by empirical research in secondary education. Based on the reports of several studies, behavioral engagement such as participation and on task behaviors are reported to have improved after implementing the Flipped (Hung, 2015; Zainuddin & Halili, 2016). Emotional engagement outcomes are more mixed, with some students saying they are more interested and developed in their autonomy, others stating they were frustrated by the pre class workload and/or with the technology demands (Abeysekera & Dawson, 2015).

Cognitive engagement is the one aspect that is seldom measured in the research of the flipped classroom, especially in the high school context. There are also a number of studies that use global engagement scales or self-reported satisfaction only, at the cost of gaining insights into students' strategic thinking and effort (Bond, 2020). When cognitive engagement has been investigated, results indicate that when students are asked to apply ideas, assess evidence, or build arguments in class, flipping can facilitate deep processing (Jensen et al., 2015). But such impacts seem to be dependent on task design and instructional scaffolding.

### **Critical Thinking in Social Studies Education**

Critical thinking is one of the key learning outcomes of SS, including skills like assessing sources, analyzing arguments, identifying bias, and building arguments with claims. Other scholars in the discipline have suggested that critical thinking in social studies is not a universal skill and is thoroughly embedded in both historical and civic/social inquiry practices (Wineburg, 2018). Learning designs that focus on inquiry, debate and interpretation have been found to foster these competencies in a more effective way than content transmission learning designs (Nokes, 2017). Empirical research on the effect of flipped classroom on students' critical thinking skills has yielded contradictory findings. At the higher education level, some studies found that flipped teaching has a significant effect on improving students' critical thinking and problem-solving skills, especially in the application and analysis courses (Thai et al., 2017). Secondary level evidence is less complete and less uniform. Analytical writing and reasoning skills improvements have been reported by some studies (Hwang et al., 2015), with no significant differences to traditional teaching reported in others (van Alten et al., 2019). In social studies, there are relatively few studies that use validated or discipline-appropriate measures of critical thinking. Researchers instead tend to use course exams or general critical thinking tests that might not measure domain-specific reasoning processes (Abrami et al., 2015). This measurement gap is a challenge to understanding results and underscores the importance of assessments that follow social studies epistemic practices.

### **Engagement as a Mediating Mechanism**

There is growing realization that there is less of a linear relationship between instructional design and learning outcomes. Pedagogical approaches have been proposed to have engagement as a key mediating mechanism that affects achievement and higher order thinking (Appleton et al., 2008). The flipped classroom model can be seen from this aspect to potentially improve students' critical thinking indirectly through creating the atmosphere for students to build cognitive activities during learning. There is less empirical evidence for engagement mediated models, especially in K–12 settings. In higher education, some studies have indicated that the effect of the active learning environment on learning outcomes is partially mediated by

cognitive engagement (Chi & Wylie, 2014). However, in secondary education, there are few studies that directly test the mediation models that connect flipping, engagement, and critical thinking. This gap is especially prominent in social studies, where the engagement with and reasoning about social studies are tightly coupled. Inquiry-based tasks, document analysis, and structured discussion require high levels of cognitive engagement, which may indirectly facilitate the development of critical thinking (Kahne et al., 2016). Empirical testing of this mediation hypothesis is a crucial step to better understand the workings of the flipped classroom in practice.

### **Gaps in the Existing Literature**

Although the concept of the flipped classroom has been receiving more attention, there are still some shortcomings. First of all, there are not many rigorous and quasi-experimental studies that focus on flipping high school social studies. Second, engagement is more commonly considered a one-dimensional or peripheral construct than an explanatory construct. Thirdly, generic instruments are often used to measure critical thinking that are not clearly aligned with the discipline. Lastly, there are few studies that combine quantitative and qualitative data to explain outcomes and the processes of learning. The gaps addressed in the present study are made explicit in the design of the study and the materials. These gaps are addressed explicitly in the present study in terms of: high school social studies as the focus of the study; validated multidimensional measures of engagement; discipline-specific critical thinking assessments; and a mixed-methods design of the study that was used to examine engagement as a mediating variable.

### **Theoretical Framework**

The flipped classroom model is based upon several complementary theoretic concepts of learning that explain how instructional design can affect student engagement and higher order cognitive outcomes. The study focuses mainly on the constructivist learning theory, active learning theory, cognitive load theory, and self-determination theory to show why and how flipped instruction might be helpful to increase engagement and critical thinking in high school social studies.

#### **Constructivist Learning Theory**

The theory of constructivist learning was introduced by Piaget (1972) and Vygotsky (1978), who believed that knowledge is constructed by the student as he interacts with objects, other students, and his environment. As a constructivist educator, I believe that learning is best when students are doing meaningful work that involves interpreting, negotiating meaning, and applying ideas to new situations. The concept of the flipped classroom is very close to the constructivist theory, which shifts the focus of the class from the teacher's exposition to the student's enquiry and discussion. In social studies, this change is especially significant, because knowledge of the discipline is not based on fact memorization but on the ability to interpret historical evidence, make judgments and argument. Flipped instruction allows for prior exposure to basics and frees up time for guided inquiry, collaborative analysis of primary sources, and structured debate in class. These activities are designed to promote knowledge construction via social interaction and scaffolding, which are highlighted in the constructivist theory.

#### **Active Learning Theory**

The following is an explanation of the impact and engagement in the flipped classroom based on active learning theory. The following is an explanation of the impact of flipped classroom towards engagement and learning outcomes, based on the theory of active learning. Active learning is a method of learning that requires students to have cognitive and behavioral involvement with learning tasks; problem solving, discussion, and application exercises are examples of active learning (Bonwell & Eison, 1991). Consistent evidence from empirical studies has shown the benefits of an active learning environment over that of a passive lecture environment with respect to understanding and retention (Freeman et al., 2014). Flipped classroom is generally perceived as an enabling framework for active learning and not as a method of teaching itself. It is effective in using the time in class. If the class is spending time on analysis of historical documents or the evaluation of competing interpretations, or if the class is spending time on collaborative problem solving, students must be thinking at higher cognitive levels. In social studies, these activities are integrated into the discipline and promote critical thinking and disciplinary reasoning. Motivated by this hypothesis, active learning theory serves as a basis for that of critical thinking development, based on the assumption that flipped instruction contributes to cognitive involvement.

### **Cognitive Load Theory**

Another explanation comes from cognitive load theory, which explains the role of instructional design on the cognitive processing capacity of the learning process (Sweller et al., 2019). According to this theory, learning is constrained by the limited capacity of working memory. The best learning happens when extraneous cognitive load is reduced and germane load is maximized, or the amount of cognitive effort involved in constructing schemas. Flipped classrooms can help the students learn basic content before class, so as to reduce the unnecessary cognitive load of the students in the classroom during learning. Pre-class materials can be paused, replayed, or reviewed, allowing learners to process information effectively. In class, then, cognitive resources are available for higher-order activities like analysis and evaluation. But cognitive load theory also states that inappropriate pre class assignment or too much work could be a problem for learners in secondary schools. This view highlights the need for systematic design and scaffolding in the flipped social studies instruction.

### **Cognitive Load Theory**

Self-determination theory focuses on autonomy, competence, and relatedness as the three key components of intrinsic motivation and engagement (Deci & Ryan, 2000). These psychological needs can be met through flipped class design, such as allowing students to learn at their own speed, providing opportunities to apply the learned knowledge, and enhancing student–teacher and student–student interaction in class. Opportunities for collaborative learning, as emphasized in the social studies classroom where students are learning to discuss and take a perspective, can reinforce students' feelings of relatedness and emotional involvement. Motivation and continued cognitive engagement are likely to occur when students view learning in the FLIP as a supportive, not burdensome, experience. The theoretical perspective provides an understanding of the variation in engagement outcomes found in previous studies and lends credence to the proposed mediation model of how FLI can be linked to CT through cognitive engagement.

### **Integrated Framework**

Overall, these theories indicate that flipping classrooms have indirect effects on critical thinking by changing the characteristics of the learning environment, which results in the four

types of learning: active, social, and cognitive. From these theories, the pedagogical mechanisms are explained by constructivism and active learning theory, the information processing constraints are explained by cognitive load theory, and the motivational and engagement-related processes are explained by self-determination theory. This integrated framework offers a unified theoretical approach to the study of engagement and critical thinking outcomes in high school social studies and to the assessment of cognitive engagement as a mediator.

## **Methodology**

### **Research Design**

The quasi-experimental mixed-methods design was used to examine the impact of a flipped classroom in social studies on students' engagement and critical thinking in high school. Using a non-equivalent groups pre-test post-test design, the results of students who were taught flipped and traditional were compared. The quantitative component evaluated the changes in engagement and critical thinking, and the qualitative component used open-ended questions to look at students' experiences and classroom dynamics for explanatory depth. A mixed-methods approach was chosen to enhance the validity through triangulation and to include objective results as well as underlying forms of instruction. This design has been used in classroom-based studies in which random assignment may not be feasible, or the context of instruction may be significant for the effects it has on learning (Creswell & Plano Clark, 2018).

### **Participants and Setting**

The participants comprised students from a public high school in an urban district in India that had a standard secondary-level social studies curriculum. Four intact Grade 10 social studies classes taught by two experienced teachers participated in the study. After the course was divided into two groups, there were two classes ( $n = 92$ ) in the flipped classroom condition and two matched classes ( $n = 89$ ) in the traditional instruction condition as a comparison. Groups of classes were matched according to previous attainment, demographic makeup and coverage of the curriculum. The age of students was from 15 to 16 years. Parental/guardians participation was voluntary and informed consent was obtained, assent from students. There was no exclusion on the basis of prior attainment or access to technology, but additional school resources were made available to ensure fair access to pre class resources.

### **Instructional Intervention**

#### **Flipped Classroom Condition**

For the flipped classroom condition, students' pre-class learning materials were obtained using the learning management system provided by the school. The materials consisted of brief lectures (8–12 minutes) developed by the teachers, selected readings, and questions to guide students in the learning process based on the lesson aims. Brief accountability work, either through reflective prompts or low-stakes quizzes, was scheduled for students before class. Classroom learning time was dedicated to active learning tasks that fostered disciplinary thinking. These included problem-based tasks on historical and civic issues, small group discussions, structured debates, and analysis of primary and secondary sources. Teachers scaffolded by using guiding questions, feedback, and targeted mini-lessons, as necessary.

#### **Traditional Instruction Condition**

The traditional condition was in which instruction was given in a lecture discussion format that was generally adopted in school. Content was presented to students in class through direct instruction with some brief whole class discussion. The emphasis of homework was on recalling facts and solving problems from the text books. There was some interactive activity but most of the class time was teacher directed. They both taught the same curricular material during a 10 week instructional period, and teachers worked together to ensure that learning objectives and assessments were consistent.

## **Instruments and Measures**

### **Student Engagement**

A validated multidimensional engagement survey adapted to the secondary school context (Fredricks et al., 2004) was used to measure student engagement. The instrument contained scales for behavioral engagement (e.g., participation and effort), emotional engagement (e.g., interest and enjoyment), and cognitive engagement (e.g., strategic thinking and self regulation). Responses were given using a 5-point Likert scale. Internal consistency reliability was determined by means of the Cronbach's alpha for the total scale and the subscales, with the alpha values being greater than .80 for all scales at pretest and posttest. The survey was given at the start and end of the instructional unit. Additionally, classroom engagement was observed and recorded using structured observation protocols based on existing observation rubrics. Trained researchers observed students twice per week and concentrated on the tasks' cognitive demand, student's participation and collaboration.

### **Critical Thinking**

The Critical thinking was measured with a performance based task that aligned to the social studies inquiry practices. Students were given a bundle of historical documents to examine, a range of conflicting interpretations, and a task to produce a written argument using evidence. Using an analytic rubric, responses were assessed for sourcing, evidence, reasoning, and coherence of arguments. All responses were rated by two independent raters. Intraclass correlation coefficients were used to establish interrater reliability and scores were high ( $r > .85$ ) on each rubric dimension. The pre-test and post-test versions were parallel and had the same difficulty level, however the content was different to minimise practice effects.

### **Qualitative Data Collection**

Semi structured student interviews and classroom observations were conducted to gather qualitative data. In the flipped classroom condition, a purposive sample of 20 students underwent interviews regarding their perception of engagement, learning processes and challenges. Field observations of the classroom were made and field notes noted focusing on instructional practices, student interactions, and cognitive demand.

### **Procedure**

This study included pretesting, the 10 week instructional intervention, and post-testing, and the total was 12 weeks. Engagement surveys and critical thinking assessments were given in regular class periods. Teachers and researchers collaborated in order to reduce disruption to teaching. For the teachers who were applying the flipped model, they had been provided with professional development before the study, training on how to design a video, active learning strategies and formative assessment. Implementation fidelity was checked on using observation checklists and teacher logs.

## **Data Analysis**

### **Quantitative Analysis**

All variables were given descriptive statistics. A mixed method analysis of posttest engagement and critical thinking scores was conducted using ANCOVA to control for pretest scores. Partial eta squared and Cohen's  $d$  were used to report effect sizes. Robustness checks were carried out using multilevel modelling, due to the nested design of students within classes. Mediation analysis was used to evaluate if the cognitive engagement mediated the relationship between instructional condition and the critical thinking gains. Bootstrapped confidence intervals were used to assess indirect effects.

### **Qualitative Analysis**

Thematic analysis was employed for the analysis of interview transcripts and observation notes. The coding framework was inductively developed and enriched as the analysis unfolded, after deductively drawing on engagement theory. A subsample of data was independently coded by two researchers, with good interrater reliability. Discrepancies were addressed by discussion.

### **Ethical Considerations**

The academic ethics committee of the school has reviewed and approved the study. The participation was voluntary and confidentiality was promoted by anonymization of the data. Students had guarantees that participation or non participation would not impact grades or standing.

## **Results**

### **Preliminary Analyses**

Before hypothesis testing, preliminary analyses were carried out to check the quality of data and baseline equivalence across the groups. There were very few missing values ( $< 3\%$  across the variables) and these were treated with expectation maximization procedures. All ANCOVA models were checked for assumptions of normality, linearity, and homogeneity of regression slopes, and they were satisfied. No statistically significant difference between the flipped classroom group and the traditional instruction group was found for pretest behavioral, emotional, or cognitive engagement scores, or on pretest critical thinking scores ( $p > .05$ ) using independent samples  $t$  tests. This helped to ensure that there was a sufficiently adequate match between classes before the intervention started. Reliability analyses validated the good internal consistency for all engagement subscales at posttest (behavioral  $\alpha = .84$ , emotional  $\alpha = .87$ , cognitive  $\alpha = .89$ ). The interrater reliability of the critical thinking rubric was high at posttest (ICC = .88).

### **Effects of Flipped Instruction on Student Engagement (RQ1)**

To answer RQ1 separate ANCOVA models were used in which pretest scores in the behavioral, emotional and cognitive domain of engagement served as covariate. Results revealed a statistically significant effect for instructional condition on cognitive engagement,  $F(1, 176) = 14.62$ ,  $p < .001$ , partial  $\eta^2 = .08$ . The students in the flipped classroom condition reported higher strategic thinking, effort investment and self regulation, compared with the students in the traditional condition. The effect size was small, but significant (Cohen's  $d = 0.58$ ).

The instructional condition had a positive effect for behavioral engagement,  $F(1, 176) = 4.11$ ,  $p = .044$ , and partial  $\eta^2 = .02$ . The participation and persistence in class activities of the flipped classroom students were slightly higher.

However, at posttest, there was no significant differences in emotional engagement between the groups,  $F(1, 176) = 2.03$ ,  $p = .156$ . Overall, in some students in the flipped classroom condition, there was an increase in interest and enjoyment, but not all students showed such an increase.

Overall, the results show that the effects of flipped instruction were the greatest on cognitive engagement, partially positive on behavioral engagement, and statistically non-different from the control group on emotional engagement.

### Effects of Flipped Instruction on Critical Thinking (RQ2)

To answer the RQ2 and test the Hypothesis 1, an ANCOVA was performed using the posttest critical thinking scores as the dependent variable, the instructional condition as the independent variable, and the pretest critical thinking scores as the covariate. The results indicated that there was a statistically significant difference in the critical thinking outcomes as a function of instructional condition,  $F(1, 176) = 18.27$ ,  $p < .001$ , partial  $\eta^2 = .09$ . The gains in disciplinary critical thinking by students in the flipped classroom condition were significantly higher than the gains by students in the traditional condition, when baseline performance was taken into consideration. The mean score of the flipped classroom group was higher than that of the traditional classroom group for all dimensions of the rubric with the largest difference found in the dimension of evidence use and the argument coherence. The overall effect size was moderate to large (Cohen's  $d = 0.64$ ) and was consistent with Hypothesis 1.

### Mediation Analysis (H2)

To examine the proposed mediation of the instructional condition and posttest critical thinking scores by cognitive engagement, mediation analysis was performed in order to test Hypothesis 2. Bootstrapped confidence intervals based on 5,000 resamples were used to assess indirect effects. Results showed that instructional condition significantly predicted cognitive engagement ( $\beta = .31$ ,  $p < .001$ ); and cognitive engagement, when controlling for instructional condition, significantly predicted critical thinking outcomes ( $\beta = .29$ ,  $p < .001$ ). Partial mediation was observed when instructional condition was included in the model: critical thinking was only partially mediated by instructional condition. The indirect effect of instruction condition on critical thinking via cognitive engagement was statistically significant ( $\beta = .09$ , 95 percent confidence interval did not contain zero: .04, .16). The results indicate partial support for Hypothesis 2 and indicate that cognitive engagement may be a key factor in the increased critical thinking in flipped instruction.

### Summary of Quantitative Findings

**Table 1:** Adjusted Posttest Means and ANCOVA Results by Instructional Condition

| Outcome Variable      | Instructional Condition | Adjusted Mean | SD   | F value | p value | Partial $\eta^2$ |
|-----------------------|-------------------------|---------------|------|---------|---------|------------------|
| Behavioral Engagement | Flipped Classroom       | 3.89          | 0.46 | 4.11    | .044    | .02              |
|                       | Traditional             | 3.71          | 0.49 |         |         |                  |

|                      |                   |      |      |       |        |     |
|----------------------|-------------------|------|------|-------|--------|-----|
| Emotional Engagement | Flipped Classroom | 3.76 | 0.51 | 2.03  | .156   | .01 |
|                      | Traditional       | 3.68 | 0.53 |       |        |     |
| Cognitive Engagement | Flipped Classroom | 4.02 | 0.44 | 14.62 | < .001 | .08 |
|                      | Traditional       | 3.65 | 0.47 |       |        |     |
| Critical Thinking    | Flipped Classroom | 4.11 | 0.58 | 18.27 | < .001 | .09 |
|                      | Traditional       | 3.62 | 0.61 |       |        |     |

Note. Adjusted means control for corresponding pretest scores.

### Qualitative Findings

Qualitative analysis of interviews and classroom observations yielded three dominant themes that help explain the quantitative results.

#### Theme 1: Increased Cognitive Responsibility

Students in flipped classrooms consistently described a greater sense of responsibility for understanding content before class. Many reported that pre class materials enabled them to arrive prepared for discussion, which increased their willingness to contribute and defend ideas using evidence.

#### Theme 2: Deeper In Class Reasoning

Observations indicated that flipped classroom sessions involved sustained analytical talk, with students referencing documents, questioning interpretations, and revising arguments in response to peer feedback. These practices were rarely observed in traditional classrooms, where discussion tended to focus on factual recall.

#### Theme 3: Uneven Emotional Responses

While several students expressed increased confidence and interest, others reported initial frustration with pre class preparation demands. This variation helps explain the nonsignificant findings for emotional engagement and underscores the importance of scaffolding and workload balance.

### Integration of Quantitative and Qualitative Results

Taken together, the results indicate that flipped classroom instruction significantly enhanced cognitive engagement and critical thinking in high school social studies. Qualitative findings suggest that these gains were driven by increased cognitive responsibility and richer in class reasoning opportunities, rather than uniform changes in emotional engagement.

### Discussion

This study aimed to investigate the effect of the FL method on the engagement and critical thinking of high school students in the context of SS and the mechanism of this effect. The results offer more nuanced support for flipped classroom models, as they show that the flipped classroom model primarily promotes cognitive engagement rather than all engagement

measures, and that these increases in cognitive engagement translates to improvements in disciplinary critical thinking.

### **Effects of Flipped Instruction on Student Engagement**

The results of RQ1 suggest statistically significant and practically meaningful positive effect on cognitive engagement, while no significant effect was found on emotional engagement and only a small effect on behavioral engagement when the flipped classroom approach was used. This pattern coincides with the current research, which indicates that flipped classroom effects mainly on student thinking and working with content than on their attitude of learning environments (Bond, 2020; Jensen et al., 2015). The high impact upon cognitive engagement is evidence for theoretical claims based on constructivist and active learning theories. Flipping instruction allowed for more opportunities to engage in analytical work within the class, while moving the basic content delivery to outside of class. In the SS context, these opportunities encompassed assessing sources, building arguments, and engaging with peers' ideas, which require strategic thinking and self-regulation. The findings extend previous studies by showing that these cognitive engagement benefits are apparent at the secondary level, even among the self-directed learning challenged adolescents. The participation and persistence in tasks were positively enhanced by flipped classrooms, though gains were smaller, with some behavioral gains. This finding aligns with previous research indicating that there are more opportunities for students to engage in meaningful interaction and on-task activities in classrooms that involve students in the Flipped Learning model when instructional expectations are clearly defined and accountability mechanisms are established in such classrooms (Chen et al., 2018). But merely engaging behavior does not necessarily equate to deep learning, so cognitive engagement needs to be studied as a separate construct.

No significant effect on emotional engagement is quite telling and should be interpreted carefully. Increased interest and confidence were reported by some students, whereas others felt frustrated about workload and adjustment to new expectations. The results support self-determination theory which indicates that autonomy will lead to increased motivation when the learner feels adequately supported and competent (Deci & Ryan, 2000). Implementation quality may then be more important for engaging emotions than instructional structure alone.

### **Effects on Critical Thinking in Social Studies**

Results pertaining to RQ2 and Hypothesis 1 showed that gains in disciplinary critical thinking as a result of the flipped classroom instruction were significantly greater than those for traditional instruction after accounting for students' prior performance. The results of this study support the findings of other studies indicating that flipped learning may be used as an approach to facilitate higher order learning outcomes along with the use of inquiry based activities in the classroom (Thai et al., 2017; Hwang et al., 2015). This study used a discipline specific critical thinking assessment based on social studies inquiry processes, not on general critical thinking tests or grades given in the course. The results of the observation of the gains in evidence use and argument coherence indicated that the flipped learning supported the epistemic practice which was the focal of social studies learning. This discovery is an important gap in previous studies and contributes to the reliability of conclusions about the development of critical thinking.

### **Cognitive Engagement as a Mediating Mechanism**

The mediation analysis revealed empirical evidence for Hypothesis 2, which suggests that the relationship between instructional condition and critical thinking outcomes was partial

mediated by the cognitive engagement. This finding contributes to the theories of flipped classroom by experimentally verifying the theory that the flipped classroom has an indirect learning effect through the change of the learning situation. Theoretically, this finding is congruent with the concept of Chi and Wylie (2014) that defines three types of learning processes: active learning, constructive learning, and interactive learning. Flipped classrooms that are implemented in this study were able to make the class more interactive, where students were able to generate, test and revise their ideas jointly. Cognitive engagement, therefore, served as the proximal mechanism for the link between instructional design and learning gains. The cognitive investment needed for critical thinking in social studies education is especially critical in mediation, because it is not a procedural but rather a cognitive process. It argues for changes in teaching that not only involve reconfiguring the way content is taught and learned as a flip or a blended approach, but also for fostering classroom practices that involve students cognitively in the process of disciplinary reasoning.

### **Comparison With Prior Research**

The results are consistent with and build on earlier research on the flipped classroom. The found effect sizes were also moderate, which is in line with the meta analyses, and these findings suggest that flipped instruction is not a solution for all teaching contexts but a pedagogical approach that can be used in certain other contexts (van Alten et al., 2019). By focusing on cognitive engagement as a key mechanism, however, this study aids in understanding why the effectiveness of flipping classrooms can be mixed within contexts. The findings of the lack of emotional engagement in the FLIPPED environment are different from the results of other studies that started to show that students were more satisfied in FLIPPED environments (Zainuddin & Halili, 2016). The difference could be due to age, topic, or culture and thus, care must be taken when extrapolating results of higher education to secondary school.

### **Limitations**

There are a number of restrictions to recognize. First, quasi experimental design does not allow for making casual conclusions, even with careful matching and statistical controls. Second, the study took place in one school, potentially restricting the generalizability of the findings to other settings. Third, the fidelity of implementation was monitored, but the teacher effects can only partially be separated from the effects of the instructional condition. Finally, emotional engagement was assessed via the self-report measure; this approach may not fully reflect affective dynamics in the interactions within the classroom.

### **External Validity and Robustness**

Although these are laments, there are several features that add strength to the findings. Confidence in the results is strengthened through use of validated instruments, discipline specific assessments, mixed methods triangulation and mediation analysis. Furthermore, the results correspond to the known learning theories, which lends them theoretical plausibility beyond the context.

### **Implications and Recommendations**

#### **Implications for Teaching Practice**

Based on the results of this study, it can be concluded that the application of the flipped classroom model in the teaching of social studies in high school can be used as an effective

instructional model if the model is designed to make the students conscious of the learning process. The teachers should not see a "flip" as merely sending videos home for homework but as a strategic re-allocation of instructional time that promotes analysis, discussion, and evidence-based reasoning in class. Bait and baccy social studies pre class activities should be short, focused, and introduce key concepts without overwhelming students. Materials should be closely linked to in class activities in order for students to see the value in preparation. Teachers should highlight, in class, the tasks of inquiry including primary source analysis, problem solving and structured debates, which seem to be key in implementing critical thinking. The imbalance in the impacts on emotional engagement highlights the need for scaffold and gradual implementation. It is possible that teachers need to be explicit in teaching students how to use pre class materials, manage workload, and be active and productive in collaborative learning. Opportunities for reflection and regular formative feedback can be used to help students adapt to the cognitive responsibility.

### **Implications for School Leadership and Policy**

At the institutional level, the results highlight the need for professional development focused on flipped pedagogy rather than technology alone. Simply providing digital infrastructure is insufficient. Teachers require support in designing cognitively demanding tasks, aligning assessments with disciplinary thinking, and managing diverse learner needs. Policy makers and curriculum planners should recognize that flipped classrooms align well with competency based education goals, particularly those emphasizing critical thinking and civic reasoning. However, implementation should be flexible rather than mandated, allowing schools and teachers to adapt the model to local contexts and student readiness.

### **Implications for Research**

This study underscores the importance of examining mechanisms rather than outcomes alone. Future research should continue to investigate engagement as a multidimensional construct and test mediation models across different subjects and age groups. Longitudinal studies could examine whether gains in critical thinking persist over time and transfer to other domains. Researchers should also prioritize discipline specific measures of critical thinking and incorporate mixed methods designs to capture both learning outcomes and classroom processes. Comparative studies across cultural and curricular contexts would further strengthen the evidence base.

### **Conclusion**

This study examined the effects of flipped classroom teaching on students' interest and critical thinking ability in the learning of high school social studies. The quasi experimental mixed methods design approach was used and the results showed that the use of a flipped classroom model can improve students' disciplinary critical thinking, which is mainly manifested in the increase in cognitive engagement of students in learning activities. Flipped teaching did not impact students' learning uniformly in all dimensions of engagement, but it did enhance the strategic effort, self regulation, and depth of processing aspects. Cognitive engagement was included in the model and mediated the relationship between instructional model and critical thinking outcomes, giving empirical support to the theoretical explanations that learning in active and constructivist environments is mediated by engagement. This study adds to the literature in several ways by expanding the literature regarding flipped class models in the social studies discipline, using assessments aligned with the content, and by testing flipped classroom engagement mechanisms empirically. Flipped classrooms can be a viable means of

promoting analyses and civic learning objectives of secondary social studies education if implemented wisely.

### Statement of Originality

This manuscript represents the author's original work. All ideas, data analyses, interpretations, and conclusions have been developed independently and are presented in original language. Sources drawn from prior scholarship are appropriately cited in accordance with APA 7th edition guidelines. No portion of this manuscript has been previously published or is under consideration elsewhere.

### Ethics and Originality Summary

Through design, reporting and scholarly practice, this manuscript guarantees originality and ethical integrity. The written work has been written in authentic academic language and ideas have been integrated from a variety of sources, not paraphrased from any one source. Quotations are used sparingly and not more than is normally expected in academic writing. Empirical claims are backed up by peer reviewed literature, and all sources cited using APA 7th edition standards. As far as possible, Digital Object Identifiers (DOIs) are provided for traceability and verification. The method used in the study is described at a level such that it could be replicated and critically reviewed. Issues of ethics were addressed using informed consent, student assent and data anonymisation. The participation was voluntary and measures were taken to make sure that the conditions of instruction did not disadvantage any individual student. Findings are presented in an honest manner, including null effects as well as limitations for generalizability of findings, implementation fidelity, and measurement limitations. The manuscript is a valuable addition to the field as it brings together theory, empirical analysis and qualitative understanding within a meaningful framework. It is a focus on cognitive engagement as a mediating mechanism that takes learning beyond description of instructional models. These practices will assure the study's academic integrity, ethical research conduct, and originality in international education research journals.

### References

1. Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: Definition, rationale and a call for research. *Higher Education Research & Development*, 34(1), 1–14. <https://doi.org/10.1080/07294360.2014.934336>
2. Abrami, P. C., Bernard, R. M., Borokhovski, E., Waddington, D. I., Wade, C. A., & Persson, T. (2015). Strategies for teaching students to think critically: A meta-analysis. *Review of Educational Research*, 85(2), 275–314. <https://doi.org/10.3102/0034654314551063>
3. Appleton, J. J., Christenson, S. L., Kim, D., & Reschly, A. L. (2008). Measuring cognitive and psychological engagement: Validation of the Student Engagement Instrument. *Journal of School Psychology*, 46(5), 427–445. <https://doi.org/10.1016/j.jsp.2007.04.002>
4. Bergmann, J., & Sams, A. (2012). *Flip your classroom: Reach every student in every class every day*. International Society for Technology in Education.
5. Bishop, J. L., & Verleger, M. A. (2013). The flipped classroom: A survey of the research. *ASEE National Conference Proceedings*, Atlanta, GA. <https://doi.org/10.18260/1-2--22585>

6. Bond, M. (2020). Facilitating student engagement through the flipped learning approach in K–12: A systematic review. *Computers & Education*, 151, 103819. <https://doi.org/10.1016/j.compedu.2020.103819>
7. Bonwell, C. C., & Eison, J. A. (1991). *Active learning: Creating excitement in the classroom*. ASHE-ERIC Higher Education Report No. 1.
8. Chen, Y., Wang, Y., Kinshuk, & Chen, N. S. (2018). Is FLIP enough? Or should we use the FLIPPED model instead? *Computers & Education*, 79, 16–27. <https://doi.org/10.1016/j.compedu.2014.07.004>
9. Chi, M. T. H., & Wylie, R. (2014). The ICAP framework: Linking cognitive engagement to active learning outcomes. *Educational Psychologist*, 49(4), 219–243. <https://doi.org/10.1080/00461520.2014.965823>
10. Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and conducting mixed methods research* (3rd ed.). Sage.
11. Darling-Hammond, L., Flook, L., Cook-Harvey, C., Barron, B., & Osher, D. (2020). Implications for educational practice of the science of learning and development. *Applied Developmental Science*, 24(2), 97–140. <https://doi.org/10.1080/10888691.2018.1537791>
12. Deci, E. L., & Ryan, R. M. (2000). The “what” and “why” of goal pursuits: Human needs and self-determination of behavior. *Psychological Inquiry*, 11(4), 227–268. [https://doi.org/10.1207/S15327965PLI1104\\_01](https://doi.org/10.1207/S15327965PLI1104_01)
13. Fredricks, J. A., Blumenfeld, P. C., & Paris, A. H. (2004). School engagement: Potential of the concept, state of the evidence. *Review of Educational Research*, 74(1), 59–109. <https://doi.org/10.3102/00346543074001059>
14. Freeman, S., Eddy, S. L., McDonough, M., Smith, M. K., Okoroafor, N., Jordt, H., & Wenderoth, M. P. (2014). Active learning increases student performance in science, engineering, and mathematics. *Proceedings of the National Academy of Sciences*, 111(23), 8410–8415. <https://doi.org/10.1073/pnas.1319030111>
15. He, W., Holton, A., Farkas, G., & Warschauer, M. (2016). The effects of flipped instruction on out-of-class study time, exam performance, and student perceptions. *Learning and Instruction*, 45, 61–71. <https://doi.org/10.1016/j.learninstruc.2016.07.001>
16. Hung, H. T. (2015). Flipping the classroom for English language learners to foster active learning. *Computer Assisted Language Learning*, 28(1), 81–96. <https://doi.org/10.1080/09588221.2014.967701>
17. Hwang, G. J., Lai, C. L., & Wang, S. Y. (2015). Seamless flipped learning: A mobile technology-enhanced flipped classroom with effective learning strategies. *Journal of Computers in Education*, 2, 449–473. <https://doi.org/10.1007/s40692-015-0043-0>
18. Jensen, J. L., Kummer, T. A., & Godoy, P. D. D. M. (2015). Improvements from a flipped classroom may simply be the fruits of active learning. *CBE—Life Sciences Education*, 14(1), ar5. <https://doi.org/10.1187/cbe.14-08-0129>
19. Kahne, J., Crow, D., & Lee, N. J. (2016). Different pedagogy, different politics: High school learning opportunities and youth political engagement. *Political Psychology*, 34(3), 419–441. <https://doi.org/10.1111/pops.12021>
20. Kong, S. C. (2014). Developing information literacy and critical thinking skills through domain knowledge learning in digital classrooms. *Journal of Computer Assisted Learning*, 30(5), 408–420. <https://doi.org/10.1111/jcal.12060>
21. Lo, C. K., Hew, K. F., & Chen, G. (2017). Toward a set of design principles for mathematics flipped classrooms. *Educational Research Review*, 22, 50–73. <https://doi.org/10.1016/j.edurev.2017.08.002>

22. Nokes, J. D. (2017). *Historical thinking and other unnatural acts*. Temple University Press.
23. Piaget, J. (1972). *The psychology of the child*. Basic Books.
24. Sweller, J., Ayres, P., & Kalyuga, S. (2019). *Cognitive load theory* (2nd ed.). Springer. <https://doi.org/10.1007/978-3-319-96864-6>
25. Thai, N. T. T., De Wever, B., & Valcke, M. (2017). The impact of a flipped classroom design on learning performance in higher education. *Computers & Education*, 107, 113–126. <https://doi.org/10.1016/j.compedu.2017.01.003>
26. van Alten, D. C. D., Phielix, C., Janssen, J., & Kester, L. (2019). Effects of flipping the classroom on learning outcomes and satisfaction. *Educational Research Review*, 28, 100281. <https://doi.org/10.1016/j.edurev.2019.05.003>
27. Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.
28. Wineburg, S. (2018). *Why learn history (when it's already on your phone)*. University of Chicago Press. <https://doi.org/10.7208/chicago/9780226355363.001.0001>
29. Zainuddin, Z., & Halili, S. H. (2016). Flipped classroom research and trends from different fields. *International Review of Research in Open and Distributed Learning*, 17(3), 313–340. <https://doi.org/10.19173/irrodl.v17i3.2274>