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# Enhancing Student Engagement in Social Science through the Flipped Instructional Strategy Integrated with the Jigsaw Technique among Secondary School Students

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## Abstract

*Student engagement is widely recognized as a key determinant of effective learning and academic success. However, sustaining meaningful engagement remains a challenge in secondary school classrooms where traditional teacher-centred approaches continue to predominate. The present study investigated the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement among secondary school students in Social Science. A 2 × 2 factorial pre-test–post-test experimental design was employed involving 550 Class IX students from four CBSE-affiliated secondary schools in Amritsar, Punjab, India. The participants were equally assigned to an experimental group (n = 275) and a control group (n = 275). Student engagement was measured using the Student Engagement Scale and the collected data were analysed using descriptive statistics, independent samples t-tests, and Two-Way Analysis of Variance (ANOVA). The findings revealed that students taught through the Flipped Instructional Strategy integrated with the Jigsaw Technique demonstrated significantly higher student engagement than those taught through the Traditional Teaching Strategy (t(548) = 2.776, p = .006). Significant differences were also observed between boys and girls (t(548) = –3.167, p = .002), while the interaction effect between instructional strategy and gender was statistically significant (F(1, 546) = 12.453, p < .001). The findings provide empirical evidence that integrating flipped learning with Jigsaw Technique enhances student engagement and supports the adoption of learner-centred instructional approaches in secondary school Social Science classrooms.*

***Keywords**: Flipped Instructional Strategy, Jigsaw Technique, Student Engagement, Cooperative Learning, Secondary School Students, Social Science, Experimental Study.*

## Introduction

Student engagement has emerged as a central indicator of educational quality because it reflects the extent to which students actively participate in classroom learning and invest behavioural, emotional, and cognitive effort in academic activities. Rather than merely attending classes, engaged students interact with learning tasks, collaborate with peers, persist in challenging situations, and demonstrate greater responsibility for their own learning. Consequently, student engagement has been consistently associated with improved academic achievement, motivation, critical thinking, classroom participation, and school retention (Fredricks et al., 2004; Kahu, 2013). More recently, Bond et al. (2020), in a systematic review of technology-enhanced learning, concluded that instructional approaches promoting active participation and collaboration significantly strengthen student engagement across different educational contexts. These findings indicate that improving student engagement has become a fundamental objective of contemporary school education.

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Despite this recognition, maintaining meaningful engagement continues to be a persistent challenge in secondary school classrooms. In many schools, teaching remains predominantly teacher-centred, where students receive information through lectures with relatively few opportunities to question, discuss, collaborate, or apply their learning. Although such instructional practices may facilitate syllabus completion, they often fail to promote sustained classroom participation or deeper cognitive involvement. Freeman et al. (2014), through a meta-analysis involving 225 studies, reported that active learning approaches consistently improved student performance and reduced failure rates compared with traditional lecture-based instruction. Similarly, Prince (2004) argued that instructional methods emphasizing active participation foster greater conceptual understanding and learner engagement than conventional teaching practices. These findings highlight the need for learner-centred instructional approaches capable of transforming students from passive recipients of information into active participants in the learning process.

Among the learner-centred approaches receiving increasing attention, the Flipped Instructional Strategy has emerged as an effective model for promoting active learning. In this approach, students study instructional content before attending class through teacher-prepared videos, presentations, or other digital resources, while classroom time is devoted to collaborative learning, discussion, and application-based activities. This reorganization of learning enables students to acquire foundational knowledge independently and utilize classroom interaction for higher-order thinking and problem-solving. A comprehensive review by Akçayır and Akçayır (2018) found that flipped learning positively influences students' academic achievement, motivation, classroom participation, and engagement across different educational settings. Likewise, Hew et al. (2021) reported that flipped instruction consistently enhances student learning by creating opportunities for meaningful classroom interaction and active participation. These findings suggest that the effectiveness of flipped learning extends beyond academic achievement to improving the quality of students' engagement in classroom learning.

While flipped learning promotes independent preparation before class, meaningful classroom engagement also requires structured collaborative learning experiences. One widely recognized cooperative learning strategy is the Jigsaw Technique, developed by Aronson et al. (1978), in which students become responsible for learning one part of a topic and subsequently teaching it to members of their home group. This process promotes positive interdependence, individual accountability, peer interaction, and shared knowledge construction. Johnson and Johnson (2009) emphasized that cooperative learning environments strengthen academic achievement and interpersonal relationships by encouraging students to learn with and from one another. Similarly, Slavin (2014) reported that structured cooperative learning strategies improve classroom participation, communication skills, and academic engagement, while Tran (2019) observed that the Jigsaw Technique enhances students' motivation and collaborative learning by ensuring that every learner actively contributes to group learning.

Although the Flipped Instructional Strategy and the Jigsaw Technique have independently demonstrated positive educational outcomes, their integration offers unique pedagogical advantages. Students who study learning materials before class enter classroom discussions with prior conceptual understanding, allowing classroom time to be utilized for peer teaching, collaborative problem-solving, and reflective learning. Such integration combines the flexibility of self-paced learning with the benefits of cooperative learning, thereby promoting behavioural, emotional, and cognitive engagement simultaneously. From a constructivist perspective, knowledge is actively constructed through interaction, discussion, and shared experiences rather than transmitted directly from teacher to learner (Bruner, 1966; Vygotsky, 1978). Therefore, integrating the Flipped Instructional Strategy with the Jigsaw Technique provides a theoretically grounded instructional model capable of creating active, collaborative, and engaging classroom environments.

The relevance of such learner-centred instructional practices is particularly evident in Social Science education, where meaningful learning extends beyond remembering facts to understanding social issues, developing critical thinking, and cultivating responsible citizenship. The National Education Policy (Ministry of Education, 2020) advocates experiential learning, collaborative learning, competency-based education, and effective technology integration to make classroom learning more participatory and meaningful. Likewise, the National Curriculum Framework (NCF, 2023) encourages instructional approaches that foster inquiry, discussion, and collaborative problem-solving. These policy initiatives reinforce the importance of adopting innovative instructional strategies capable of enhancing students' engagement in Social Science classrooms.

Although previous studies have established the effectiveness of flipped learning and cooperative learning independently, relatively few experimental investigations have examined the combined effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement, particularly in secondary school Social Science classrooms. Existing research has predominantly focused on academic achievement, learner satisfaction, or motivation, whereas student engagement has received comparatively less attention as a primary outcome variable (Akçayır & Akçayır, 2018; Bond et al., 2020; Hew et al., 2021). Furthermore, empirical evidence from Indian CBSE secondary schools remains limited despite increasing emphasis on learner-centred pedagogy under the National Education Policy (2020). Addressing these research gaps, the present study investigates the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement among secondary school students in Social Science.

**Objectives and Hypotheses**

**Objectives**

The present study was undertaken to achieve the following objective:

- To study the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement in relation to gender.

**Hypotheses**

The following null hypotheses were formulated and tested to achieve the objective of the study:

**$H_{01}$:** There exists no significant difference between the experimental and control groups on the scores of student engagement.

**$H_{02}$:** There exists no significant difference between boys and girls on the scores of student engagement.

**$H_{03}$:** There exists no significant interaction effect between instructional strategy and gender on the scores of student engagement.

**Methodology**

- **Research Design**

The present study employed a 2 × 2 factorial pre-test-post-test experimental design to investigate the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement among secondary school students. The design was considered appropriate as it enabled the investigator to examine the effectiveness of the instructional intervention while simultaneously determining the influence of gender and the interaction effect between instructional strategy and gender on student engagement.The independent variable was instructional strategy, comprising two levels, namely the Flipped Instructional Strategy integrated with the Jigsaw Technique and the Traditional Teaching Strategy. Gender (boys and girls) served as the classificatory variable, whereas student engagement was treated as the dependent variable. The inclusion of pre-test and post-test measures ensured that the equivalence of the experimental and control groups could be established prior to the intervention and that the effectiveness of the instructional treatment could be assessed accurately following its implementation.

- **Sample**

The study was conducted among 550 Class IX students studying in four CBSE-affiliated secondary schools located in Amritsar, Punjab, India. The schools were selected purposively based on the availability of Information and Communication Technology (ICT) facilities required for implementing the Flipped Instructional Strategy. The participants were equally distributed into an experimental group (n = 275) and a control group (n = 275).Before the commencement of the experimental treatment, both groups were administered the Student Engagement Scale as a pre-test to establish baseline equivalence. The pre-test analysis revealed no statistically significant difference between the experimental and control groups, indicating that the two groups were comparable with respect to student engagement prior to the intervention.

- **Research Instrument**

Student engagement was measured using the Student Engagement Scale developed by Dr. Amit Kauts and Dr. Sukhmandeep Kaur (2021). The standardized instrument assesses students'

engagement across behavioural, emotional, and cognitive dimensions and has established reliability and validity for use with secondary school students.

The scale was administered twice during the course of the investigation. It was first administered before the implementation of the instructional intervention to determine the initial level of student engagement and subsequently administered as a post-test after the completion of the experimental treatment to assess the effect of the instructional strategy.

- **Experimental Procedure**

The experimental investigation was conducted over a period of approximately 24 instructional days. Before the commencement of the intervention, both the experimental and control groups completed the Student Engagement Scale to determine their initial level of engagement.

Students in the experimental group were taught selected Social Science units through the Flipped Instructional Strategy integrated with the Jigsaw Technique. Prior to each classroom session, students accessed teacher-prepared instructional materials, including videos, presentations, and reading resources, enabling them to acquire foundational knowledge independently. Classroom sessions were subsequently devoted to structured Jigsaw-based collaborative learning activities, where students worked in expert and home groups to discuss concepts, exchange ideas, solve problems, and teach one another under the guidance of the teacher.

In contrast, students in the control group received instruction through the Traditional Teaching Strategy, which primarily consisted of teacher explanations, classroom lectures, textbook-based instruction, question-answer sessions, and individual learning activities. Upon completion of the intervention, both groups were administered the Student Engagement Scale as a post-test to determine the effectiveness of the instructional treatment.

- **Statistical Analysis**

The data collected during the study were analysed using IBM SPSS Statistics. Descriptive statistics, including the mean and standard deviation, were computed to summarize the student engagement scores of the experimental and control groups. An Independent Samples *t*-test was employed to examine the significance of differences between the instructional groups and between boys and girls. Furthermore, a Two-Way Analysis of Variance (ANOVA) was performed to determine the main effects of instructional strategy and gender, as well as their interaction effect on student engagement. All hypotheses were tested at the 0.05 level of significance.

**Results**

The post-test data were analysed to examine the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement among secondary school students. The findings are presented under three sections: (i) the main effect of instructional strategy, (ii) the main effect of gender, and (iii) the interaction effect of instructional strategy and gender.

- **Main Effect of Instructional Strategy on Student Engagement**

Descriptive statistics were computed to compare the post-test student engagement scores of the experimental and control groups. The results are presented in Table 1:

**Table 1: Descriptive Statistics of Post-test Student Engagement Scores by Instructional Group**

| Instructional Group | n | Mean | SD | Median | Skewness | Kurtosis |
|---|---|---|---|---|---|---|
| Experimental | 275 | **136.18** | 24.69 | 137.00 | -0.086 | -0.277 |
| Control | 275 | **130.43** | 24.00 | 130.00 | -0.017 | 0.082 |
| Total | 550 | **133.30** | 24.49 | 134.50 | -0.042 | -0.129 |

***Note. n = Number of students; SD = Standard deviation***

Table 1 indicates that the experimental group obtained a higher mean post-test student engagement score (M = 136.18, SD = 24.69) than the control group (M = 130.43, SD = 24.00), with a mean difference of 5.75 points. The skewness and kurtosis values for both groups were close to zero, indicating that the distributions were approximately normal and suitable for parametric statistical analysis.To determine whether the observed difference between the two instructional groups was statistically significant, an independent samples *t*-test was performed. The results are presented in Table 2:

**Table 2: Independent Samples *t*-Test for Post-test Student Engagement Scores by Instructional Group**

| Variable | Levene's *F* | *P* | *t* | *df* | *P* | Mean Difference | 95% CI of Difference |
|---|---|---|---|---|---|---|---|
| Student Engagement | 1.157 | .283 | 2.776 | 548 | .006 | 5.764 | 1.686 to 9.841 |

As presented in Table 2, Levene's test was not statistically significant ($F$ = 1.157, $p$ = .283), confirming that the assumption of homogeneity of variance was satisfied. The independent samples *t*-test revealed a statistically significant difference between the experimental and control groups, $t(548) = 2.776$, $p$ = .006. Students taught through the Flipped Instructional Strategy integrated with the Jigsaw Technique achieved significantly higher post-test student engagement scores than those taught through the Traditional Teaching Strategy. Therefore, **$H_{01}$,** stating that there exists no significant difference between the experimental and control groups on the scores of student engagement, was rejected.

- **Main Effect of Gender on Student Engagement**

To examine whether student engagement differed with respect to gender, descriptive statistics were computed separately for boys and girls. The results are presented in **Table 3**.

**Table 3: Descriptive Statistics of Post-test Student Engagement Scores by Gender**

| Gender | *n* | Mean | SD |
|---|---|---|---|
| Boys | 324 | **130.57** | 23.46 |
| Girls | 226 | **137.23** | 25.43 |
| **Total** | **550** | **133.31** | **24.49** |

***Note. n = Number of students; SD = Standard deviation***

As shown in Table 3, girls obtained a higher mean post-test student engagement score (M = 137.23, SD = 25.43) than boys (M = 130.57, SD = 23.46), indicating comparatively higher levels of student engagement among female students.To determine whether this observed difference was statistically significant, an independent samples *t*-test was conducted. The results are presented in Table 4:

**Table 4: Independent Samples *t*-Test for Post-test Student Engagement Scores by Gender**

| Variable | Levene's *F* | *P* | *t* | *df* | *p* | Mean Difference | 95% Confidence Interval |
|---|---|---|---|---|---|---|---|
| Student Engagement | 1.011 | .315 | -3.167 | 548 | .002 | -6.667 | -10.802 to -2.531 |

As presented in Table 4, Levene's test was not statistically significant ($F$ = 1.011, $p$ = .315), indicating that the assumption of homogeneity of variance was satisfied. The independent samples *t*-test revealed a statistically significant difference between boys and girls, $t(548) = -3.167$, $p$ = .002. The negative mean difference reflects the higher engagement scores of girls compared with boys. Therefore, **$H_{02}$**, stating that there exists no significant difference between boys and girls on the scores of student engagement, was rejected.

While the independent samples *t*-tests established the main effects of instructional strategy and gender separately, they did not determine whether the effectiveness of the Flipped Instructional Strategy integrated with the Jigsaw Technique differed for boys and girls. Therefore, a Two-Way Analysis of Variance (ANOVA) was performed to examine the main effects of instructional strategy and gender, as well as their interaction effect on student engagement.

- **Interaction Effect of Instructional Strategy and Gender on Student Engagement**

To examine whether the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement differed between boys and girls, descriptive statistics were computed for each combination of instructional strategy and gender. The results are presented in Table 5:

**Table 5: Descriptive Statistics of Post-test Student Engagement Scores by Instructional Strategy and Gender**

| Instructional Group | Gender | *n* | Mean | SD |
|---|---|---|---|---|
| Experimental | Boys | 166 | **130.55** | 23.07 |
| Experimental | Girls | 109 | **144.78** | 24.68 |
| **Experimental Total** | | **275** | **136.18** | **24.68** |

| | | | | |
|---|---|---|---|---|
| Control | Boys | 158 | **130.59** | 23.94 |
| Control | Girls | 117 | **130.21** | 24.18 |
| **Control Total** | | **275** | **130.43** | **24.00** |
| **Overall Total** | | **550** | **133.31** | **24.49** |

***Note. n = Number of students; SD = Standard deviation***

Table 5 indicates variations in post-test student engagement across the combinations of instructional strategy and gender. Girls in the experimental group obtained the highest mean engagement score (M = 144.78, SD = 24.68), whereas girls in the control group obtained a lower mean score (M = 130.21, SD = 24.18). In contrast, the mean engagement scores of boys in the experimental (M = 130.55) and control (M = 130.59) groups were almost identical. These descriptive results suggest that the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on student engagement differed across gender groups. The statistical significance of these differences was examined using a Two-Way Analysis of Variance (ANOVA).

**Table 6: Two-Way Analysis of Variance for Post-test Student Engagement**

| Source | df | Mean Square | *F* | *p* |
|---|---|---|---|---|
| Instructional Strategy (A) | 1 | 7024.053 | **12.316** | < .001 |
| Gender (B) | 1 | 6376.528 | **11.181** | .001 |
| Instructional Strategy × Gender (A × B) | 1 | 7102.396 | **12.453** | < .001 |
| Error | 546 | 570.317 | | |
| Corrected Total | 549 | | | |

Model Summary: $R^2$ = .054; Adjusted $R^2$ = .049.

As presented in Table 6, the main effect of instructional strategy was statistically significant, $F(1, 546) = 12.316$, $p < .001$, indicating that students taught through the Flipped Instructional Strategy integrated with the Jigsaw Technique achieved significantly higher student engagement than those taught through the Traditional Teaching Strategy. The main effect of gender was also statistically significant, $F(1, 546) = 11.181$, $p = .001$, indicating that student engagement differed significantly between boys and girls.

Furthermore, the interaction effect between instructional strategy and gender was statistically significant, $F(1, 546) = 12.453$, $p < .001$. This finding indicates that the effectiveness of the Flipped Instructional Strategy integrated with the Jigsaw Technique was not uniform across gender groups. As shown in Table 5, the intervention produced a substantial increase in student engagement among girls, whereas the engagement scores of boys remained largely comparable across the experimental and control groups. Accordingly, $H_{03}$, stating that there exists no significant interaction effect between instructional strategy and gender on the scores of student engagement, was rejected.

Overall, the findings demonstrate that both instructional strategy and gender significantly influenced student engagement, and that the effectiveness of the Flipped Instructional Strategy integrated with the Jigsaw Technique varied according to gender.

**Discussion**

The findings of the present study revealed that students taught through the Flipped Instructional Strategy integrated with the Jigsaw Technique demonstrated significantly higher student engagement than those taught through the Traditional Teaching Strategy, leading to the rejection of $H_{01}$. The integrated instructional approach enabled students to acquire foundational knowledge before classroom instruction and actively participate in collaborative learning activities during class, thereby promoting greater engagement in the learning process. These findings are consistent with those of Akçayır and Akçayır (2018), Lo and Hew (2017), and Hew et al. (2021), who reported that flipped learning enhances classroom participation, motivation, and student engagement. Similarly, Johnson and Johnson (2009) and Slavin (2014) emphasized that cooperative learning strategies encourage active participation, peer interaction, and collaborative knowledge construction. The findings also support the constructivist perspective (Bruner, 1966; Vygotsky, 1978), which suggests that meaningful learning is enhanced when students actively construct knowledge through interaction and collaboration.

The findings of the present study indicated a significant difference in student engagement between boys and girls, with girls demonstrating significantly higher engagement than boys. Consequently, $H_{02}$ was rejected. The higher engagement scores of girls may be attributed to their greater participation in collaborative learning activities, classroom discussions, and academic interactions, which

encouraged active involvement throughout the instructional process. This finding is consistent with the studies of Fredricks et al. (2004), who emphasized that behavioural, emotional, and cognitive engagement may vary across student characteristics, and Bond et al. (2020), who reported that learner-centred and collaborative learning environments positively influence student engagement. The findings are also in agreement with Kahu (2013), who viewed student engagement as a dynamic construct influenced by both individual learner characteristics and the learning environment. The results suggest that gender should be considered while designing instructional strategies aimed at maximizing student engagement in secondary school classrooms.

The findings further revealed a significant interaction effect between instructional strategy and gender on student engagement, leading to the rejection of $H_{03}$. This indicates that the effectiveness of the Flipped Instructional Strategy integrated with the Jigsaw Technique was influenced by gender, with the intervention was associated with a greater improvement in student engagement among girls than among boys within the present study. The integrated instructional approach provided opportunities for collaborative learning, peer teaching, and active classroom participation, which may have enhanced girls' involvement in the learning process to a greater extent. These findings are consistent with the cooperative learning principles proposed by Johnson and Johnson (2009) and Slavin (2014), who emphasized that structured collaborative learning promotes positive interdependence, individual accountability, and active participation among learners. The results also support the constructivist perspective of Vygotsky (1978), which highlights the importance of social interaction in knowledge construction. The significant interaction effect suggests that learner-centred instructional strategies may not influence all students uniformly and that gender can moderate the effectiveness of innovative pedagogical approaches in promoting student engagement.

**Conclusion**

The present study examined the effect of the Flipped Instructional Strategy integrated with the Jigsaw Technique on the engagement of secondary school students in Social Science. The findings demonstrated that the integrated instructional strategy was significantly more effective than the Traditional Teaching Strategy in enhancing student engagement. Significant differences were also observed with respect to gender, with girls demonstrating higher engagement than boys. Furthermore, the significant interaction effect between instructional strategy and gender indicated that the effectiveness of the intervention varied across gender groups. These findings highlight the potential of integrating flipped learning with cooperative learning to create more interactive, learner-centred, and engaging classroom environments. The study contributes to the growing body of evidence supporting innovative pedagogical approaches and provides empirical support for the integration of technology-enabled and collaborative instructional strategies in secondary school education. The findings provide empirical support for integrating the Flipped Instructional Strategy with the Jigsaw Technique as an effective learner-centred pedagogical approach for enhancing student engagement in secondary school Social Science classrooms.

**Educational Implications**

The findings have important implications for classroom practice, teacher education, and educational policy. Social Science teachers may integrate the Flipped Instructional Strategy with the Jigsaw Technique to promote active participation and collaborative learning among secondary school students. Teacher education programmes should equip pre-service and in-service teachers with the knowledge and skills required to implement learner-centred instructional approaches supported by digital technologies. Furthermore, curriculum planners and school administrators may encourage the adoption of technology-supported cooperative learning environments in alignment with the recommendations of the National Education Policy (2020) to enhance student engagement and improve learning experiences.

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