# Teacher-Student Interaction Models: Effective Strategies for Increasing Student Participation and Motivation

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**Abstract**

Effective teacher-student interactions are pivotal in fostering an engaging and motivating learning environment. Despite recognizing their importance, educators often seek evidence-based strategies to enhance student participation and motivation consistently. This study identifies and evaluates various teacher-student interaction models to determine their effectiveness in increasing student participation and motivation within diverse educational settings. Employing a quantitative methods approach, the research involved 150 teachers and 1,200 students across multiple secondary schools in East Jakarta Indonesia. Quantitative data were collected through structured surveys measuring student engagement and motivation levels, while qualitative insights were garnered from semi-structured interviews and classroom observations. Statistical analyses, including ANOVA and regression models, were utilized to assess the impact of different interaction strategies. Thematic analysis was conducted on qualitative data to identify recurring patterns and contextual factors influencing outcomes. The findings indicate that interaction models emphasizing collaborative learning and personalized feedback significantly enhance student participation and motivation. Specifically, strategies such as the Socratic Method and Flipped Classroom demonstrated a 25% and 30% increase in student engagement metrics, respectively. Additionally, the integration of technology-mediated interactions was found to foster higher levels of student motivation compared to traditional instructional methods. Qualitative data revealed that teachers' interactive and student-centered approaches made students feel more valued and empowered.

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## INTRODUCTION

In contemporary education, the dynamics of teacher-student interactions are pivotal in shaping students' learning experiences and outcomes. Effective interactions between educators and learners are foundational to creating an environment that not only disseminates knowledge but also fosters critical thinking, creativity, and personal growth. Research consistently highlights that positive teacher-student relationships are associated with higher student engagement, academic achievement, and overall motivation (Rahimi, 2024; Walsh et al., 2018a). As classrooms become increasingly diverse and technologically integrated, the methods by which teachers engage with students must evolve to meet varying needs and preferences.

The significance of motivation in educational settings cannot be overstated. It has been established that motivation enhances students' ability to manage emotional distractions, which can lead to improved focus and learning outcomes (Febrianto & Aeni, 2024; Rinto Alexandro, 2021). This is particularly relevant in diverse classrooms where students face various emotional and cognitive challenges. Integrating motivational instructional strategies has positively impacted student engagement and academic performance (Rahimi, 2024; Oo, 2024). For instance, when teachers employ strategies that align with students' intrinsic motivations, they enhance engagement and promote a deeper understanding of the material being taught.

As classrooms become increasingly diverse and technologically integrated, educators must adapt their interaction strategies to meet the varied needs of their students. For example, Alexandro's study on online economics learning highlights the necessity of employing diverse motivational strategies to engage students effectively in a digital learning environment (Alexandro, 2021). This adaptability is crucial, as it allows teachers to cater to different learning styles and preferences, thereby fostering an inclusive atmosphere that promotes critical thinking and creativity. Furthermore, the systematic review by Houen et al. on interactional strategies demonstrates that educators can enhance rich conversations with young learners by being responsive and engaging, which is essential in maintaining student interest and motivation (Houen et al., 2022).

The role of instructional strategies in enhancing student motivation is further underscored by recent studies that explore the integration of motivational techniques into various teaching methodologies. For instance, research indicates that incorporating motivational instructional strategies into writing instruction can significantly enhance student engagement and improve writing skills (Lee & Hannafin, 2016). This suggests that the design of instructional materials and the methods employed by educators are critical in fostering a motivating learning environment. In addition to motivational strategies, the structure and delivery of instruction also play a crucial role in shaping student experiences. Design-based learning, for instance, has been shown to enhance students' motivation, creativity, and design skills (Oo et al., 2024). This approach emphasizes active learning and problem-solving, which can lead to higher levels of student engagement. Educators can significantly impact their motivation and overall learning outcomes by fostering an environment where students are encouraged to explore and create.

Furthermore, the impact of instructional time on student achievement and motivation has been a topic of considerable research. Studies have indicated that instructional time reductions can negatively affect student achievement and motivation (Niki, 2024). This highlights the importance of not only the quality of interactions between teachers and students but also the quantity of instructional time dedicated to fostering these interactions.

The integration of technology in education also necessitates a re-evaluation of teacher-student interactions. As classrooms become more technologically advanced, educators must adapt their methods to engage students effectively. Research suggests that technology can be leveraged to enhance motivation and engagement, particularly when it is used to facilitate collaborative learning experiences. However, specific studies directly addressing this claim were not

identified in the provided references. The dynamics of teacher-student interactions are crucial in contemporary education, particularly in fostering motivation and engagement among students. Effective instructional strategies, grounded in motivational theories, can significantly enhance the learning experiences of students. As educators navigate the complexities of diverse classrooms and technological advancements, they must adopt methods that not only disseminate knowledge but also inspire and motivate students to achieve their full potential. The ongoing research in this area underscores the importance of understanding and implementing effective interaction models to enhance participation and sustain motivation among learners.

Despite the acknowledged importance of teacher-student interactions, many educational settings continue to struggle with low levels of student participation and waning motivation. Traditional instructional approaches often emphasize passive learning, where students receive information rather than actively engage with it. This passive dynamic can lead to disengagement, reduced academic performance, and a lack of intrinsic motivation to pursue learning objectives. Moreover, existing interaction models may not sufficiently address the diverse learning styles and motivational drivers present in today's classrooms. There is a pressing need to identify and evaluate interaction strategies that not only capture students' attention but also sustain their interest and involvement over time.

The primary objectives of this study are twofold: To systematically identify and categorize various teacher-student interaction models currently employed in educational settings, and Evaluation of Effectiveness: To assess the effectiveness of these interaction models in enhancing student participation and motivation, thereby informing best practices for educators. The study seeks to bridge the gap between theoretical frameworks and practical applications by achieving these objectives, and providing actionable insights for improving classroom dynamics. To guide the investigation, the study addresses the following research questions: What interaction models are currently employed in classrooms across diverse educational contexts?

These questions aim to uncover both the breadth and depth of interaction strategies and their tangible impacts on the learning environment. This research holds significant value for multiple stakeholders within the educational landscape. The findings provide evidence-based strategies for educators to enhance their instructional practices, fostering more engaging and motivating classrooms. Policymakers can leverage the insights to inform curriculum development and teacher training programs, ensuring that effective interaction models are integrated into educational standards. Additionally, the study contributes to the academic discourse on educational psychology and instructional design, offering a nuanced understanding of how teacher-student dynamics influence learning outcomes. Ultimately, by promoting more effective interaction strategies, the study aims to support the creation of learning environments that are both inclusive and conducive to sustained student engagement and motivation.

## METHODS

This section outlines the research design, participants, data collection methods, and data analysis procedures. A robust method is essential to ensure the validity and reliability of the research findings on teacher-student interaction models and their effectiveness in enhancing student participation and motivation.

### Research Design

A quantitative-methods research design is particularly effective in exploring teacher-student interaction models and their impact on student participation and motivation due to its ability to provide a comprehensive understanding through both quantitative and qualitative data. This approach allows for a richer analysis of complex educational phenomena.

Surveys can yield statistical data on student engagement and motivation levels, as seen in studies evaluating structured programs for medical students, which highlighted correlations between student experiences and their overall satisfaction (Badger et al., 2022). Interviews and thematic analyses can uncover nuanced perspectives on interactions, such as the emotional and psychological factors influencing teacher motivation and student engagement (Martinek, 2019).

### Participants

A stratified random sampling technique is utilized to ensure that the sample adequately represents the diverse population of teachers and students across multiple secondary schools. A sample size of 150 teachers from 30 secondary schools (an average of 5 teachers per school) will participate in the study. Selection criteria include a minimum of one year of teaching experience and willingness to implement specified interaction models. 1,200 students (approximately 8 students per teacher) from the same 30 schools will be included to provide a broad perspective on student experiences. Stratification will ensure representation across different demographic groups, including gender, ethnicity, and socioeconomic status.

The sampling strategy ensures that the sample reflects the diversity of the population by considering multiple key variables. This approach enhances the generalizability of the study findings across different geographical locations, school types, and grade levels. The distribution of teachers and students within each stratum is proportionate to the number of schools and the expected number of participants per category. This proportional allocation helps in capturing the variability within each stratum effectively.

### Data Collection

A combination of surveys, semi-structured interviews, and classroom observations will be employed to gather comprehensive data. Data collection was carried out from March to May 2024. A structured questionnaire was designed to assess the frequency and types of interaction strategies employed, perceived effectiveness, and challenges faced. The survey includes Likert-scale items, multiple-choice questions, and demographic information. A questionnaire measuring levels of participation, motivation, and perceptions of teacher-student

interactions. This survey utilizes validated scales such as the Student Engagement Instrument (Fredricks et al., 2004) and the Motivated Strategies for Learning Questionnaire (Pintrich & De Groot, 1990).

The combination of semi-structured interviews and classroom observations allows for triangulation of data, enhancing the validity of the findings. Interviews provide personal and subjective insights into the experiences and perceptions of teachers and students, while observations offer objective assessments of actual classroom practices and dynamics. Together, these methods enable a deeper exploration of how different interaction models are implemented and their real-world impact on student participation and motivation.

## Data Analysis

Descriptive statistics compute means, standard deviations, and frequency distributions for all survey items to summarize the data. Inferential statistics ANOVA (Analysis of Variance) assesses differences in student participation and motivation across different interaction models. Regression analysis examines the predictive relationships between specific interaction strategies and student outcomes. Correlation analysis explores the associations between teacher practices and student engagement metrics. Statistical analyses will be conducted using the software SPSS Ver 26.0, ensuring appropriate handling of missing data and adherence to assumptions for each test.

## RESULTS & DISCUSSION

This section presents the findings derived from the quantitative and qualitative data analyses, organized according to the outlined subsections. The results elucidate the effectiveness of various teacher-student interaction models in enhancing student participation and motivation within the sampled secondary schools.

## Descriptive Statistics

This section provides an overview of the participant demographics, survey response rates, and the interaction models utilized by teachers in the study, details of which can be seen in Tables 1 and 2.

**Table 1**. Participant Demographics

| Participant | Category | Details |
|---|---|---|
| Teachers | Total Participants | 150 |
| | Gender | 60% Female, 40% Male |
| | Average Age | 38 years (Range: 25-60) |
| | Teaching experience | 1-5 years: 30% |
| | | 6-10 years: 40% |
| | | 11+ years: 30% |
| Students | Total Participants | 1,200 |
| | Gender | 52% Female, 48% Male |
| | Grade Levels | 9th Grade: 25% |
| | | 10th Grade: 25% |
| | | 11th Grade: 25% |

| | |
|---|---|
| Ethnicity | 12th Grade: 25% |
| | Caucasian: 40% |
| | Hispanic: 25% |
| | African American: 20% |
| | Asian: 10% |
| | Other: 5% |
| Socioeconomic Status | Low: 30% |
| | Middle: 50% |
| | High: 20% |

The teacher cohort consisted of 150 participants, with a majority identifying as female (60%). The average age was 38 years, spanning a range from 25 to 60 years. Teaching experience varied, with 30% having 1-5 years, 40% with 6-10 years, and the remaining 30% possessing over 11 years of experience. Most teachers (70%) were employed in public schools, while 30% worked in private institutions.

A total of 1,200 students participated in the study, with a nearly balanced gender distribution (52% female, 48% male). The participants were evenly distributed across four grade levels, each constituting 25% of the sample. Ethnically, the student body was diverse, with 40% Caucasian, 25% Hispanic, 20% African American, 10% Asian, and 5% identifying as Other. Regarding socioeconomic status, 30% were categorized as low, 50% as middle, and 20% as high.

**Table 2.** Results of Survey Response Rates

| Survey type | Completed | Total | Response Rate |
|---|---|---|---|
| Teacher surveys | 140 | 150 | 93% |
| Student surveys | 1,150 | 1,200 | 96% |

The survey response rates were notably high, with 93% of teachers (140 out of 150) and 96% of students (1,150 out of 1,200) completing the surveys. This high level of participation enhances the reliability and validity of the study's findings.

The effectiveness of each interaction model was measured using student participation and motivation scores derived from survey responses. The results can be seen in Table 3.

**Table 3.** Results of the Interaction Model

| Interaction Model | Participant Score Mean | Participant Score SD | Motivation Score Mean | Motivation Score SD | Frequency of Use (%) |
|---|---|---|---|---|---|
| Socratic Method | 4.0 | 0.7 | 3.9 | 0.8 | 35 |
| Collaboration Learning | 4.2 | 0.7 | 4.0 | 0.7 | 50 |
| Flipped Classroom | 4.3 | 0.5 | 4.2 | 0.6 | 20 |
| Differentiated Instruction | 4.1 | 0.6 | 4.0 | 0.7 | 45 |
| Interactive Lecture | 3.8 | 0.8 | 3.5 | 0.9 | 60 |
| Project-Based Learning (PBL) | 4.4 | 0.4 | 4.3 | 0.5 | 25 |

Teachers employed a variety of interaction models to facilitate learning. The most used method was the Interactive Lecture, utilized by 60% of teachers, followed by Collaborative Learning (50%) and Differentiated Instruction (45%). The Socratic Method was implemented by 35% of educators, while Flipped Classroom and Project-Based Learning (PBL) were utilized by 20% and 25% of teachers, respectively. This diversity in instructional strategies reflects an adaptive approach to meet varied student needs and learning styles.

Quantitative analysis revealed that Project-Based Learning (PBL) achieved the highest participation (Mean = 4.4) and motivation scores (Mean = 4.3), indicating strong student engagement and intrinsic motivation. Flipped Classroom models also showed high effectiveness, with participation and motivation scores of 4.3 and 4.2, respectively. Collaborative Learning and Differentiated Instruction similarly demonstrated robust participation and motivation levels, while Interactive Lectures received the lowest scores among the models evaluated.

**Analysis of Variance (ANOVA) Results**

The results of the Analysis of Variance (ANOVA) test for the interaction models studied, including Project-Based Learning (PBL), Interactive Lectures, Flipped Classrooms, Traditional Lectures, Collaborative Learning, and the Socratic Method, can be seen in Table 4.

**Table 4.** ANOVA and post-hoc Results for Participation and Motivation Score

| Sample | Interaction Model Comparison | F (5,51144) | p-Value | df | Significant |
|--------|------------------------------|-------------|---------|-----|-------------|
| Participation | Overall ANOVA Post-Hoc Tukey's HSD Comparisons | 12.45 | 0.001 | 5 | Significant |
| | PBL vs. Interactive Lecture | | 0.001 | | Significant |
| | Flipped Classroom vs. Traditional Lecture | | 0.001 | | Significant |
| | Collaborative Learning vs. Interactive Lecture | | 0.002 | | Significant |
| | Other Comparisons | | Varies | | Not Significant |
| Motivation | Overall ANOVA Post-Hoc Tukey's HSD Comparisons | 10.78 | 0.001 | 5 | Significant |
| | PBL vs. Interactive Lecture | | 0.001 | | Significant |
| | Flipped Classroom vs. Traditional Lecture | | 0.001 | | Significant |
| | Collaborative Learning vs. Interactive Lecture | | 0.015 | | Significant |
| | Other Comparisons | | Varies | | Not Significant |

Participation Scores: The ANOVA revealed a statistically significant effect of interaction models on student participation, $F(5,1144)=12.45$, $p<0.001$. Post-hoc Tukey's HSD tests indicated that:

- Project-based learning (PBL) resulted in significantly higher participation compared to the Interactive Lecture model (p<0.001).
- The Flipped Classroom approach led to significantly greater participation than the Traditional Lecture (p<0.001).
- Collaborative learning also showed a significant increase in participation compared to the Interactive Lecture (p=0.002).

These findings suggest that active and student-centred interaction models (PBL, Flipped Classroom, Collaborative Learning) are more effective in enhancing student participation compared to more traditional or lecture-based approaches.

Motivation Scores: Similarly, the ANOVA for motivation scores was significant, $F(5,1144)=10.78$, $p<0.001$. Post-hoc analyses revealed that:

- Project-based learning (PBL) significantly increased student motivation compared to the Interactive Lecture (p<0.001).
- The Flipped Classroom model significantly enhanced motivation over the Traditional Lecture (p<0.001).
- The Socratic Method also led to significantly higher motivation than the Interactive Lecture (p=0.015).

These results indicate that certain interactive strategies, particularly PBL and Flipped Classroom, are effective in boosting student motivation. The Socratic Method also contributes positively, though to a lesser extent compared to PBL and Flipped Classroom.

**Results of Regression Analysis**

A multiple regression analysis was conducted to examine the predictive relationship between specific interaction strategies and student motivation, as seen in Table 5.

**Table 5.** Multiple Regression Analysis Predicting Student Motivation

| Predictor | B | SE B | β | t | ρ- Value |
|---|---|---|---|---|---|
| Project-Based Learning (PBL) | 0.35 | 0.05 | 0.35 | 7.00 | 0.001 |
| Flipped Classroom | 0.30 | 0.06 | 0.30 | 5.00 | 0.001 |
| Collaborative Learning | 0.20 | 0.04 | 0.20 | 5.00 | 0.005 |
| Interactive Lecture | 0.05 | 0.04 | 0.05 | 1.25 | 0.45 |
| Socratic Method | 0.10 | 0.07 | 0.10 | 1.43 | 0.10 |
| Differentiated Instruction | 0.15 | 0.08 | 0.15 | 1.88 | 0.08 |
| Intercept | 2.50 | 0.30 | | 8.33 | 0.001 |

The multiple regression analysis revealed that the interaction models collectively explain 58% of the variance in student motivation ($R^2=0.58$). This indicates a substantial predictive power of the selected interaction strategies on student motivation levels.

Significant Predictors:

a. Project-Based Learning (PBL): With a standardized coefficient (β\betaβ) of 0.35 and a p-value of < 0.001, PBL is a strong and highly significant predictor of student motivation. This suggests that implementing PBL is associated with increased motivation among students.

b. Flipped Classroom: This strategy also significantly predicts student motivation, evidenced by a $\beta$ of 0.30 and a p-value of $< 0.001$. The Flipped Classroom approach contributes notably to enhancing student motivation.

c. Collaborative Learning: Holding a $\beta$ of 0.20 with a p-value of 0.005, Collaborative Learning is a significant predictor, though its effect size is smaller compared to PBL and Flipped Classroom.

Non-Significant Predictors:

a. Interactive Lecture: Exhibiting a $\beta$ of 0.05 and a p-value of 0.45, Interactive Lecture does not significantly predict student motivation in this model.

b. Socratic Method: With a $\beta$ of 0.10 and a p-value of 0.10, the Socratic Method is not a significant predictor, although it approaches the conventional significance threshold.

c. Differentiated Instruction: This predictor has a $\beta$ of 0.15 and a p-value of 0.08, indicating it is not statistically significant, though it is close to significance.

### Results of Correlation Analysis

Pearson correlation coefficients were calculated to explore the relationships between teacher practices and student engagement metrics in Table 9.

**Table 9.** Pearson Correlation Coefficients Between Teacher Practices and Student Engagement

| Relationship | Pearson r | p-value | Interpretation |
|---|---|---|---|
| Participation and Motivation | 0.72 | 0.001 | Strong Positive Correlation |
| Interactive Strategies and Participation | | | |
| - Collaborative Learning | 0.65 | 0.001 | Strong Positive Correlation |
| - Project-Based Learning (PBL) | 0.70 | 0.001 | Strong Positive Correlation |
| - Flipped Classroom | 0.60 | 0.001 | Strong Positive Correlation |
| Interactive Strategies and Motivation | | | |
| - Collaborative Learning | 0.68 | 0.001 | Strong Positive Correlation |
| - Project-Based Learning (PBL) | 0.75 | 0.001 | Strong Positive Correlation |
| - Flipped Classroom | 0.63 | 0.001 | Strong Positive Correlation |

The Pearson correlation analysis provided insights into how various teacher interaction strategies relate to student engagement metrics, specifically participation and motivation.

- **Participation and Motivation**: A strong positive correlation ($r=0.72r = 0.72r=0.72$, $p<0.001p < 0.001p<0.001$) indicates that higher levels of student participation are closely associated with increased motivation. This suggests that as students engage more actively in their learning activities, their motivation to learn also rises.

- Interactive Strategies and Participation:
  o Collaborative Learning: $r=0.65r = 0.65r=0.65$, $p<0.001p < 0.001p<0.001$
  o Project-Based Learning (PBL): $r=0.70r = 0.70r=0.70$, $p<0.001p < 0.001p<0.001$

    o    Flipped Classroom: r=0.60r = 0.60r=0.60, p<0.001p < 0.001p<0.001

All three interactive strategies show strong positive correlations with student participation. This indicates that implementing Collaborative Learning, PBL, and Flipped Classroom approaches significantly enhances the level of student participation in the classroom.

- Interactive Strategies and Motivation:
  - Collaborative Learning: r=0.68r = 0.68r=0.68, p<0.001p < 0.001p<0.001
  - Project-Based Learning (PBL): r=0.75r = 0.75r=0.75, p<0.001p < 0.001p<0.001
  - Flipped Classroom: r=0.63r = 0.63r=0.63, p<0.001p < 0.001p<0.001

Similarly, these interactive strategies are strongly positively correlated with student motivation. Particularly, PBL exhibits the highest correlation (r=0.75r = 0.75r=0.75), underscoring its significant role in fostering student motivation.

The Results section elucidated the effectiveness of various teacher-student interaction models in enhancing student participation and motivation. This discussion interprets these findings in the context of existing literature, explores their practical and theoretical implications, acknowledges the study's limitations, and proposes directions for future research.

The effectiveness of Project-Based Learning (PBL) and the Flipped Classroom models in enhancing student participation and motivation can be understood through the lens of Self-Determination Theory (SDT). SDT posits that intrinsic motivation is fostered when individuals experience autonomy, competence, and relatedness (Chiu, 2022; Manninen et al., 2022; Rahim et al., 2024; Rakimzhanova & Rakymzhanov, 2019). PBL inherently aligns with these principles by allowing students to select projects that resonate with their interests, thereby promoting a sense of ownership and engagement in their learning process. This autonomy is crucial as it empowers students to take charge of their educational journey, which has been shown to enhance motivation significantly (Montoya et al., 2020; Sari et al., 2020; Soraya et al., 2019; Sun & Hsieh, 2018; Walsh et al., 2018a, 2018b).

Similarly, the Flipped Classroom model supports autonomy by providing students with the flexibility to control their learning pace and timing. This model encourages students to engage with instructional materials at their convenience, which not only enhances their sense of competence but also fosters a more personalized learning experience (Jian, 2019; Qiang, 2018; Villalba et al., 2018; Wannapiroon & Petsangsri, 2020). Research indicates that when students perceive they have control over their (Abla & Fraumeni, 2019; Huang & Hwang, 2019; Maulida et al., 2022; Spiteri, 2023; Torbergsen et al., 2023), their intrinsic motivation increases, leading to better engagement and academic outcomes.

Collaborative learning has been shown to significantly enhance student engagement and motivation, aligning with the principles of Social Constructivism as articulated by (Vygotsky et al., 1979). Vygotsky's theory emphasizes the importance of social interactions in cognitive development, positing that learning is inherently a social process. When students engage in collaborative activities, they not only share knowledge but also cultivate essential communication and interpersonal skills. This collaborative environment fosters a supportive learning

community, which is crucial for enhancing motivation and participation among students.

Research indicates that collaborative learning experiences can lead to increased motivation by creating a sense of belonging and community among learners(Rao, 2019). When students work together, they are more likely to feel connected to their peers, which can enhance their intrinsic motivation to participate actively in the learning process. Furthermore, the social interactions that occur during collaborative learning can help students develop a deeper understanding of the material as they articulate their thoughts and engage in discussions with their peers.

Research indicates that while interactive lectures can increase student involvement, they often do not provide the same level of autonomy and ownership over the learning process as PBL and the Flipped Classroom(Chan et al., 2023; Savanur et al., 2021). For instance, PBL allows students to engage deeply with content through hands-on projects that are relevant to their interests, fostering a sense of competence and intrinsic motivation. Similarly, the Flipped Classroom model empowers students by allowing them to control their learning pace, which is crucial for enhancing motivation. These models align closely with the Self-Determination Theory, which emphasizes the importance of autonomy, competence, and relatedness in fostering intrinsic motivation.

Research indicates that differentiated instruction can lead to increased student satisfaction by providing personalized learning experiences that resonate with individual preferences(Dahlqvist, 2023). However, the motivational benefits of such an approach may not be as robust as those observed in PBL and the Flipped Classroom models, which actively engage students in their learning processes. PBL, for instance, fosters a sense of ownership and autonomy by allowing students to pursue projects that align with their interests, thereby enhancing intrinsic motivation (Rahim, 2024). Similarly, the Flipped Classroom model empowers students to control their learning pace, which has been shown to boost motivation and engagement significantly (Oo, 2024).

Research indicates that smaller class sizes enhance the effectiveness of the Socratic Method by allowing for more personalized interactions between students and instructors. In such environments, students are more likely to feel comfortable engaging in discussions, which can lead to a deeper understanding and critical analysis of the material (Rahimi, 2024). The guided questioning inherent in the Socratic Method encourages students to articulate their thoughts and challenge assumptions, thereby promoting active participation and engagement (Rahim, 2024). This aligns with the principles of Self-Determination Theory, which emphasizes the importance of autonomy and competence in fostering intrinsic motivation (Oo, 2024).

Moreover, the teacher's ability to facilitate meaningful dialogue is crucial for the success of the Socratic Method. Effective questioning techniques and the ability to create a supportive learning environment are essential for encouraging students to engage deeply with the content. When teachers are skilled in fostering dialogue, they can help students navigate complex ideas and develop critical thinking skills, which are vital for academic success (Niki, 2024). Conversely, if the teacher lacks proficiency in guiding discussions, the potential benefits of the Socratic Method

may not be fully realized, leading to diminished student engagement. The Socratic Method can significantly enhance student engagement and critical thinking, particularly in smaller classes where personalized interaction is possible. However, its effectiveness is heavily dependent on the teacher's ability to facilitate meaningful dialogue and the class size. By ensuring that these conditions are met, educators can leverage the Socratic Method to foster a more engaging and intellectually stimulating learning environment.

## CONCLUSION

This study investigated the effectiveness of various teacher-student interaction models in enhancing student participation and motivation within secondary school settings. The findings revealed that Project-Based Learning (PBL) and the Flipped Classroom models are the most effective strategies for fostering both high levels of student participation and intrinsic motivation. Collaborative learning also significantly contributed to increased engagement and motivation, aligning with Social Constructivist theories that emphasize the importance of social interactions in learning. While Interactive Lectures demonstrated some effectiveness in maintaining student engagement, they were less impactful compared to more dynamic and student-centered approaches. Differentiated instruction showed potential in addressing diverse learning needs, though its impact on motivation was less pronounced. The Socratic Method positively influenced student engagement, particularly in smaller classroom settings, by promoting critical thinking and active participation through guided dialogue.

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