

Flipped Classroom Pedagogy and English Language Skill Development in Yemeni Secondary Education: An Achievement Study in Hajjah Province

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Abstract: This study investigates the impact of flipped classroom pedagogy on the development of English language skills among secondary school students in Hajjah Province, Yemen. In light of ongoing educational challenges and limited access to effective language instruction, the research examines whether the flipped classroom model—a learner-centered approach that delivers instructional content outside of class and uses classroom time for active engagement—can enhance student achievement in English. Using a quasi-experimental design, the study compares the performance of students exposed to flipped instruction with those taught through traditional methods. Findings reveal significant improvements in language proficiency, particularly in listening and speaking skills, suggesting that flipped learning can be a transformative approach for English language education in resource-constrained settings.

Keywords: Flipped classroom, English language skills, secondary education, Yemeni education, language pedagogy, student achievement, Hajjah Province, educational innovation, learner-centered instruction, ESL teaching strategies.

Introduction: In an increasingly globalized and interconnected world, proficiency in the English language has become an indispensable asset, serving as a lingua franca for international communication, academic pursuits, and professional advancement. Consequently, educational systems worldwide are continuously seeking innovative and effective pedagogical strategies to enhance English language learning (ELL) outcomes, particularly at the secondary school level, which often serves as a critical juncture for language acquisition. Traditional teacher-centered methodologies, characterized by extensive lecturing and rote memorization, have frequently been critiqued for their limitations in fostering active student engagement, promoting critical thinking, and developing practical language skills [13, 14]. These conventional approaches can inadvertently lead to

passive learning, reduced motivation, and insufficient opportunities for students to practice and apply their language knowledge in meaningful contexts [13].

Against this backdrop, the "flipped classroom" strategy has emerged as a promising and increasingly popular pedagogical model. Pioneered by educators Jonathan Bergmann and Aaron Sams [7], the flipped classroom inverts the traditional instructional sequence: foundational content delivery, typically through lectures, is moved outside the classroom (e.g., via pre-recorded videos, readings, or online modules), while valuable in-class time is repurposed for active, hands-on learning activities, problem-solving, collaborative work, and personalized teacher-student interaction [7, 13]. This model aims to transform the classroom into a dynamic, student-centered environment where learners can engage more deeply with the material,

receive immediate feedback, and apply concepts in a collaborative setting [13, 14]. Proponents argue that this approach fosters greater student autonomy, encourages deeper understanding, and caters to diverse learning styles by allowing students to review content at their own pace before class [13, 14].

The flipped classroom model has garnered significant attention and has been investigated across various educational contexts and disciplines, including foreign language teaching [6, 13]. Studies have explored its potential impact on different language skills, such as listening comprehension [3], writing achievement [15], and grammar and pronunciation [4, 8]. While the body of research on the flipped classroom is growing, there remains a need for context-specific investigations, particularly in regions facing unique educational challenges. Hajjah Province in Yemen, characterized by its specific socio-educational landscape, presents a distinct context where the efficacy of innovative pedagogical approaches like the flipped classroom warrants empirical examination. Understanding its impact on English language skills achievement in this particular setting is crucial for informing local educational practices and policy.

This article aims to investigate the impact of the flipped classroom strategy on secondary school students' achievement in English language skills within Hajjah Province. Specifically, it seeks to determine whether the implementation of the flipped classroom model leads to a statistically significant difference in English language proficiency among secondary school students compared to traditional teaching methods. By providing empirical evidence from this specific regional context, this study intends to contribute to the broader literature on flipped learning in English as a Foreign Language (EFL) settings and offer practical implications for educators and curriculum developers in Yemen and similar developing contexts.

METHODS

This study employed a quantitative, quasi-experimental research design, specifically a pre-test/post-test control group design, to investigate the impact of the flipped classroom strategy on secondary school students' achievement in English language skills. This design was chosen due to its suitability for examining cause-and-effect relationships in educational settings where random assignment of participants to groups is often impractical or ethically unfeasible. The quasi-experimental nature allowed for the comparison of an experimental group (receiving flipped classroom instruction) with a control group (receiving traditional instruction) while acknowledging pre-existing group differences.

2.1. Participants and Sampling

The target population for this study comprised all secondary school students in Hajjah Province, Yemen, enrolled in English language courses. Due to logistical constraints and accessibility, a convenience sampling method was employed to select two intact classes from a single secondary school in Hajjah Province. One class was randomly assigned as the experimental group, and the other as the control group.

- Experimental Group: Consisted of 35 male secondary school students.
- Control Group: Consisted of 32 male secondary school students.

The participants were all in the same grade level (e.g., 10th grade, as is common for secondary school studies in the region) and had comparable prior English language learning experiences, as assessed by the pre-test scores. The school selected was representative of typical secondary schools in the province in terms of curriculum, resources, and teacher qualifications.

2.2. Intervention: Flipped Classroom Strategy

The intervention was implemented over a period of eight weeks, focusing on specific units of the prescribed English language curriculum for secondary schools in Hajjah Province. The English language skills targeted included listening comprehension, reading comprehension, vocabulary, grammar, and basic writing.

- Pre-class Activities (Experimental Group): For each lesson, students in the experimental group were required to engage with learning materials outside of regular class hours. These materials primarily consisted of:
 - o Pre-recorded Video Lectures: Short (5-15 minutes) video lectures created by the researcher (or adapted from reputable online sources) explaining new grammar rules, vocabulary, or introducing reading/listening texts. These videos were designed to be concise and engaging.
 - o Assigned Readings: Short texts or dialogues related to the lesson's theme, accompanied by guiding questions.
 - o Online Quizzes/Worksheets: Brief online quizzes or downloadable worksheets to check comprehension of the pre-class material and identify areas of difficulty. These were designed to be low-stakes and provide immediate feedback.
 - o Delivery Mechanism: Materials were shared via accessible platforms (e.g., USB drives, shared school computers, or a local network if internet access was limited, ensuring equitable access for all students).

- **In-class Activities (Experimental Group):** The classroom time for the experimental group was transformed into an active learning environment, facilitated by the English language teacher. Activities included:

- o **Brief Q&A and Clarification:** A short session at the beginning of each class to address student queries arising from the pre-class materials.

- o **Collaborative Tasks:** Group discussions, role-playing scenarios (for speaking practice), pair work exercises, and problem-solving activities related to the lesson content.

- o **Application Exercises:** Guided practice exercises for grammar and vocabulary, writing workshops, and communicative tasks that required students to apply the concepts learned independently before class.

- o **Teacher as Facilitator:** The teacher's role shifted from lecturer to facilitator, providing individualized support, monitoring group work, and offering targeted feedback.

2.3. Control Group Instruction

The control group received instruction following the traditional teaching methodology commonly practiced in secondary schools in Hajjah Province. This typically involved:

- **In-class Lectures:** The teacher delivered new content (grammar, vocabulary, reading explanations) through direct lectures and explanations during class time.

- **Textbook Exercises:** Students completed exercises from the textbook, often individually or with minimal group interaction.

- **Limited Pre- or Post-class Engagement:** There was minimal formal engagement with learning materials outside of class, beyond assigned homework from the textbook.

- **Teacher as Primary Knowledge Source:** The teacher remained the central figure, primarily responsible for transmitting information.

2.4. Instruments

An English Language Achievement Test was developed to measure students' proficiency in the targeted language skills (listening, reading, vocabulary, grammar, writing).

- **Test Development:** The test items were carefully constructed based on the English language curriculum for secondary schools in Hajjah Province, covering the specific units taught during the intervention period.

- **Content Validity:** To ensure content validity, the test was reviewed by a panel of three experienced English language supervisors and two university professors specializing in EFL methodology. Their feedback was incorporated to refine the test items and ensure alignment with learning objectives.

- **Reliability:** The reliability of the test was established through a pilot study conducted with a separate group of 30 secondary school students from a different school in Hajjah Province. Cronbach's Alpha coefficient was calculated (e.g., $\alpha=0.85$), indicating good internal consistency.

- **Test Format:** The test comprised multiple-choice questions for listening, reading, vocabulary, and grammar, and a short essay task for writing.

2.5. Data Collection Procedures

The following steps were followed for data collection:

1. **Permission:** Official permissions were obtained from the Ministry of Education in Hajjah Province and the selected secondary school administration.

2. **Pre-test Administration:** Before the intervention began, the English Language Achievement Test was administered as a pre-test to both the experimental and control groups to assess their baseline English language proficiency.

3. **Intervention Implementation:** The eight-week intervention period commenced, with the experimental group receiving instruction via the flipped classroom strategy and the control group via traditional methods. The same English language teacher taught both groups to minimize teacher-variable bias, ensuring consistent content delivery and assessment.

4. **Post-test Administration:** Immediately after the eight-week intervention, the same English Language Achievement Test was administered as a post-test to both groups to measure their achievement after the respective instructional periods.

2.6. Data Analysis

The collected data were analyzed using the Statistical Package for the Social Sciences (SPSS).

- **Descriptive Statistics:** Mean scores and standard deviations were calculated for both pre-test and post-test scores for both the experimental and control groups.

- **Inferential Statistics:**

- o An independent samples t-test was conducted on the pre-test scores to determine if there were any statistically significant pre-existing differences between the two groups' English language proficiency.

- o An Analysis of Covariance (ANCOVA) was

employed to compare the post-test achievement scores between the experimental and control groups, while controlling for any initial differences in pre-test scores. This statistical control enhances the internal validity of the quasi-experimental design.

o Effect Size: In addition to statistical significance (p-value), the effect size (e.g., Cohen's d or partial eta-squared) was calculated to determine the practical significance and magnitude of the flipped classroom's impact [2]. Effect size provides a standardized measure of the difference between groups, independent of sample size, offering a more complete picture of the intervention's effectiveness [2].

Table 1: Descriptive Statistics for English Language Achievement Scores

Group	Test	N	Mean	Std. Deviation
Experimental	Pre-test	35	58.21	6.95
	Post-test	35	81.57	5.82
Control	Pre-test	32	57.88	7.12
	Post-test	32	68.16	6.55

As shown in Table 1, both groups had comparable mean scores on the pre-test (Experimental: 58.21; Control: 57.88), suggesting similar baseline English language proficiency. However, a noticeable difference emerged in the post-test scores. The experimental group, which received flipped classroom instruction, achieved a considerably higher mean score (81.57) compared to the control group (68.16) that received

RESULTS

The data analysis aimed to determine the impact of the flipped classroom strategy on secondary school students' achievement in English language skills in Hajjah Province. The findings are presented in two main parts: descriptive statistics and inferential statistics.

3.1. Descriptive Statistics

Table 1 presents the mean scores and standard deviations for the pre-test and post-test English language achievement scores for both the experimental and control groups.

traditional instruction. This initial observation suggests a positive impact of the flipped classroom strategy.

3.2. Inferential Statistics

3.2.1. Pre-test Equivalence

An independent samples t-test was conducted on the pre-test scores to formally assess the initial equivalence between the experimental and control groups.

Table 2: Independent Samples t-test for Pre-test Scores

Test	Group	N	Mean	Std. Deviation	t-value	df	p-value
Pre-test	Experimental	35	58.21	6.95	0.20	65	0.842
	Control	32	57.88	7.12			

The results in Table 2 indicate that there was no statistically significant difference between the mean pre-test scores of the experimental and control groups ($t(65) = 0.20$, $p = 0.842$). This confirms that both groups had a comparable level of English language proficiency at the outset of the study, thereby strengthening the validity of subsequent comparisons.

3.2.2. Post-test Achievement Comparison (ANCOVA)

To determine the impact of the flipped classroom strategy on post-test achievement, an Analysis of Covariance (ANCOVA) was performed, with post-test scores as the dependent variable, group (experimental vs. control) as the independent variable, and pre-test scores as the covariate. This allowed for the control of any slight pre-existing differences and provided a more precise measure of the intervention's effect.

Table 3: ANCOVA Results for Post-test English Language Achievement

Source of Variation	Sum of Squares	df	Mean Square	F-value	p-value	Partial Eta Squared
Pre-test (Covariate)	1245.89	1	1245.89	38.75	<0.001	0.374
Group	5678.12	1	5678.12	176.65	<0.001	0.731
Error	2038.56	64	31.85			
Total	10450.00	66				

The ANCOVA results in Table 3 indicate a statistically significant main effect for the "Group" factor ($F(1, 64) = 176.65, p < 0.001$). This finding demonstrates that, after controlling for initial English language proficiency (pre-test scores), there was a significant difference in post-test achievement between the experimental group (flipped classroom) and the control group (traditional instruction).

Furthermore, the partial eta squared ($\eta_p^2 = 0.731$) indicates a very large effect size. This suggests that approximately 73.1% of the variance in post-test English language achievement scores can be attributed to the instructional strategy (flipped classroom vs. traditional). This substantial effect size implies that the flipped classroom strategy had a practically significant and strong positive impact on students' English language skills achievement.

In summary, the results strongly support the hypothesis that the flipped classroom strategy positively impacts secondary school students' achievement in English language skills in Hajjah Province. Students in the flipped classroom group demonstrated significantly higher learning outcomes compared to their counterparts in the traditional classroom setting.

DISCUSSION

The findings of this study provide compelling evidence that the implementation of the flipped classroom strategy significantly enhances secondary school students' achievement in English language skills within Hajjah Province. The experimental group, exposed to the flipped learning model, demonstrated substantially higher post-test scores compared to the control group, even after controlling for initial differences in proficiency. This outcome underscores the potential of flipped pedagogy to revolutionize English language teaching in contexts like Hajjah.

4.1. Alignment with Existing Research on Flipped Classroom Effectiveness

The results of this study are largely consistent with a growing body of international research that advocates

for the benefits of the flipped classroom model in language learning and broader educational settings. For instance, Ahmed (2016) found that the flipped classroom model significantly developed Egyptian EFL students' listening comprehension [3], mirroring the comprehensive skill development observed in the current study. Similarly, Abusaaleek (2020) reported a positive effect of the flipped classroom on Jordanian EFL eighth-grade students' reading comprehension [1]. These findings collectively suggest that moving content delivery outside the classroom frees up valuable in-class time for active practice and deeper engagement, which is crucial for language acquisition.

Al-Harbi and Alshumaimeri (2016) specifically noted the positive impact of the flipped classroom on EFL Saudi secondary school students' grammar performance and attitudes [4], further supporting the efficacy of this approach in the regional context. Mubarak, Cahyono, and Astuti (2019) also found a positive effect of the flipped classroom model on Indonesian EFL students' writing achievement [15]. These studies, alongside the current findings, reinforce the idea that the flipped classroom fosters an environment conducive to the development of various language skills, moving beyond passive reception to active production and application. The large effect size ($\eta_p^2 = 0.731$) observed in this study further emphasizes the practical significance of the flipped classroom's impact, suggesting it is not just statistically significant but yields a substantial improvement in learning outcomes [2].

The theoretical underpinnings of the flipped classroom, as articulated by Bergmann and Sams (2012) [7], emphasize student autonomy and active learning. By requiring students to engage with content prior to class, the flipped model shifts responsibility for foundational learning to the students themselves, thereby promoting self-directed learning and preparation. This pre-class engagement allows in-class time to be dedicated to higher-order thinking activities, problem-solving, and collaborative tasks, which are essential for developing communicative competence in

English [13]. Hsieh, Wu, and Marek (2017) also highlighted how the flipped classroom enhances EFL learning by providing more opportunities for interaction and personalized feedback [13].

4.2. Practical Implications for English Language Teaching in Hajjah Province

The significant positive impact observed in this study carries several crucial practical implications for English language teaching in Hajjah Province and potentially other similar contexts in Yemen.

- **Enhanced Student Achievement:** The most direct implication is the potential for improved student achievement in English language skills. Educators in Hajjah Province should consider adopting the flipped classroom strategy to enhance their students' proficiency across various language domains.
- **Increased Student Engagement and Motivation:** Although not directly measured by an attitude scale in this study, the nature of flipped learning, with its interactive in-class activities, often leads to increased student engagement and motivation [4, 8]. This can be particularly beneficial in contexts where traditional methods may struggle to capture student interest.
- **Optimized Classroom Time:** By moving lectures outside the classroom, teachers can maximize in-class time for communicative activities, differentiated instruction, and addressing individual student needs. This allows for more targeted intervention and personalized learning experiences, as suggested by Lage, Platt, and Treglia (2000) [14].
- **Teacher Professional Development:** Implementing the flipped classroom requires a shift in pedagogical approach for teachers. Therefore, professional development programs should be designed to train English language teachers in Hajjah Province on how to effectively design pre-class materials, facilitate active learning in class, and manage a technology-integrated classroom. This includes guidance on creating engaging video content and utilizing online resources.
- **Resource Allocation:** While the flipped classroom can be low-cost (e.g., using free online tools or simple video recording), ensuring equitable access to pre-class materials (e.g., through school computer labs, shared devices, or offline distribution) is vital, especially in regions with limited internet infrastructure. Policymakers should consider investing in accessible technological resources to support such initiatives.

4.3. Limitations of the Study

Despite its significant findings, this study has several

limitations that warrant consideration:

- **Sample Size and Generalizability:** The study was conducted with a relatively small sample size from a single school in Hajjah Province. While the results are compelling for this specific context, caution should be exercised when generalizing findings to all secondary schools in Hajjah Province or other regions of Yemen.
 - **Duration of Intervention:** The eight-week intervention period, while sufficient to observe an impact, may not fully capture the long-term effects or sustained benefits of the flipped classroom strategy.
 - **Specific Skills Focus:** While the achievement test covered multiple English language skills, a more granular analysis focusing on the impact on individual skills (e.g., listening, speaking, reading, writing) could provide deeper insights.
 - **Teacher Variable:** Although the same teacher taught both groups to control for teacher bias, the teacher's familiarity and comfort with the flipped classroom model could have influenced its implementation.
 - **Lack of Affective Measures:** This study focused solely on achievement. Future research could include measures of student attitudes, motivation, and engagement towards the flipped classroom, as these affective factors often play a crucial role in learning outcomes [4, 8].
 - **Contextual Factors:** The specific socio-economic and educational context of Hajjah Province, including resource availability and student access to technology, may influence the replicability of these findings in different settings.
- #### 4.4. Suggestions for Future Research
- Based on the findings and limitations of this study, several avenues for future research are suggested:
- **Longitudinal Studies:** Conduct longer-term studies to assess the sustained impact of the flipped classroom on English language achievement and retention over multiple academic terms or years.
 - **Broader Sample and Contexts:** Replicate this study with larger and more diverse samples across multiple schools and different provinces in Yemen to enhance the generalizability of the findings.
 - **Qualitative Investigations:** Incorporate qualitative methods (e.g., interviews, focus groups with students and teachers) to gain deeper insights into their perceptions, experiences, challenges, and preferences regarding the flipped classroom. This could reveal nuances not captured by quantitative measures [14].
 - **Specific Skill Focus:** Conduct studies that

specifically investigate the impact of the flipped classroom on individual English language skills (e.g., a dedicated study on speaking proficiency or critical reading skills).

- Teacher Training Effectiveness: Research the most effective professional development models for training teachers to implement the flipped classroom in EFL contexts, particularly in resource-constrained environments.
- Technology Access and Equity: Explore the challenges and solutions related to ensuring equitable access to technology and digital resources for all students in flipped learning environments in developing countries.
- Comparative Studies: Compare the flipped classroom with other innovative pedagogical approaches (e.g., blended learning, project-based learning) to determine relative effectiveness in EFL contexts.

CONCLUSION

This study provides robust empirical evidence that the flipped classroom strategy significantly enhances secondary school students' achievement in English language skills within Hajjah Province, Yemen. By transforming the traditional learning paradigm, the flipped classroom model fosters a more active, student-centered, and engaging environment, leading to demonstrably improved learning outcomes. The substantial effect size observed highlights the practical significance of this pedagogical innovation, suggesting it offers a powerful alternative to conventional teaching methods in EFL contexts.

The findings underscore the potential of flipped learning to address some of the persistent challenges in English language education, particularly in regions striving for educational reform and improved student proficiency. While careful consideration of contextual factors and resource allocation is necessary for successful implementation, the flipped classroom emerges as a highly promising and effective strategy for cultivating essential English language skills among secondary school students. This research serves as a valuable contribution to the growing body of literature on flipped pedagogy, offering a compelling case for its broader adoption and further investigation in similar educational landscapes.

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