

Research Article

Cite this article: Al-Qatawneh, S. (2025). The Impact of Flipped Learning on Secondary Students' Achievement in Arabic Grammar and Their Attitudes: An Experimental Study in Jordan. *Educational Process: International Journal*, 17, e2025363.

<https://doi.org/10.22521/edupij.2025.17.363>

Received March 20, 2025

Accepted June 27, 2025

Published Online August 9, 2025

Keywords: Achievement, Flipped Learning, Empact, Attitudes, Secondary stage, grammar, Arabic language.

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The Impact of Flipped Learning on Secondary Students' Achievement in Arabic Grammar and Their Attitudes: An Experimental Study in Jordan

Sami Al-Qatawneh 

Abstract

Background/purpose. This study aimed to examine the effect of flipped learning on secondary school students' achievement in Arabic grammar and their attitudes towards its implementation in Jordan.

Materials/methods. A quasi-experimental design was employed, with a sample of 63 seventh-grade students divided into two groups: experimental ($n = 32$) and control ($n = 31$). The experimental group received instruction through a flipped learning approach, while the control group was taught using traditional methods. Data were collected using a researcher-developed achievement test (Cronbach's $\alpha = 0.881$) and an attitudes questionnaire (Cronbach's $\alpha = 0.803$). The data analysis involved independent-sample t-tests, paired-sample t-tests, and Levene's test for homogeneity of variances. Effect sizes (Cohen's d) were also calculated.

Results. Results indicated statistically significant differences in favor of the experimental group in achievement scores ($p < 0.05$, $d = 0.59$). Furthermore, students' attitudes significantly improved after exposure to flipped learning ($p < 0.001$, $d = 2.10$).

Conclusion. The study confirms that flipped learning is an effective instructional approach for improving students' achievement in Arabic grammar and enhancing their attitudes towards learning. Its implementation can foster student-centered learning environments and promote active engagement in language classrooms.

Originality/value. This research contributes to the limited literature on the application of flipped learning in Arabic grammar instruction at the secondary level in Jordan, providing empirical support for its pedagogical value.

1. Introduction

The continuous advancement in educational technology has led to significant transformations in teaching and learning approaches. Among these innovative models is flipped learning, which reverses the conventional classroom structure by shifting direct instruction outside the classroom and utilizing class time for interactive and collaborative activities. This pedagogical shift empowers students to take an active role in their learning, enhancing comprehension, engagement, and higher-order thinking skills (Bergmann & Sams, 2012; Abeysekera & Dawson, 2015). Arabic grammar, as a core component of Arabic language instruction, presents notable challenges to learners. Many students struggle with mastering grammatical rules, often due to the reliance on traditional, teacher-centered instructional methods that focus heavily on rote memorization rather than functional language use (Al-Zaboun et al., 2022; Mahmoud, 2017). Such methods may fail to engage students meaningfully or foster deep understanding, resulting in persistent weaknesses in grammatical competence. In Jordan, the Ministry of Education has recently revised the Arabic language curriculum to align with modern pedagogical trends, emphasizing outcome-based learning and integrative approaches (National Center for Curriculum Development, 2024). These reforms highlight the need for innovative instructional strategies that promote student-centered learning environments, such as flipped learning, to support learners' mastery of grammatical structures through active engagement and practical application. Despite the growing global body of research on flipped learning, there have been limited empirical studies examining its impact specifically on Arabic grammar instruction in Jordanian secondary schools. Existing studies have primarily focused on foreign language contexts or higher education settings, leaving a gap in the literature concerning the effectiveness of flipped learning in Arabic language classrooms at the secondary level.

1.1. Problem Statement

Many students struggle to master Arabic grammar due to the prevailing reliance on traditional instructional methods. Therefore, this study aims to investigate whether implementing flipped learning can enhance secondary students' achievement in Arabic grammar and positively impact their attitudes towards learning.

1.2. Objective of the Study

This study aims to explore the impact of flipped learning on secondary school students' achievement in Arabic grammar and their attitudes towards its use in Jordanian schools.

1.3. Study Question

This study seeks to answer the following research questions:

RQ1: To what extent does the implementation of flipped learning affect secondary students' achievement in Arabic grammar?

RQ2: What are the attitudes of secondary students towards learning Arabic grammar using the flipped learning approach?

1.4. Significance of Study

This research contributes to the existing literature by:

- Addressing a research gap concerning the use of flipped learning in Arabic grammar instruction at the secondary level.
- Offering practical implications for curriculum designers, teacher educators, and policymakers seeking to enhance Arabic language instruction.

- Providing empirical evidence to inform professional development programs aimed at equipping teachers with the necessary skills to implement flipped learning effectively.

2. Literature Review

The flipped learning approach has garnered considerable attention in recent years due to ongoing developments in educational technologies and the growing need for more student-centered pedagogies. Flipped learning reverses the traditional instructional model by delivering direct instruction outside the classroom, often through pre-recorded videos, while classroom time is devoted to collaborative activities that promote deeper understanding and active engagement (Bergmann & Sams, 2012; Bishop & Verleger, 2013).

Numerous studies have supported the advantages of flipped learning in various educational contexts. Abeysekera and Dawson (2015) argued that flipped learning reduces cognitive load by allowing students to preview materials at their own pace, thus increasing engagement and academic achievement. Similarly, O'Flaherty and Phillips (2015) emphasized that flipped classrooms enhance students' self-directed learning, critical thinking, and problem-solving abilities. Specifically, in language education, flipped learning has demonstrated positive outcomes in grammar instruction. Amini, Roohani, and Jafarpour (2022) reported significant improvements in second language grammatical performance and reduced language anxiety among students exposed to flipped teaching. Likewise, Dincer and Polat (2022) found that employing flipped learning in English as a foreign language (EFL) grammar instruction led to higher student achievement and satisfaction. However, while much of the existing literature focuses on English language learning, relatively fewer studies have addressed the application of flipped learning to Arabic grammar instruction.

Al-Zaboun et al. (2022) provided evidence that flipped learning has a positive impact on the grammar skills of non-native Arabic learners. Similarly, Saidah (2019) demonstrated improved grammar performance among students who engaged with flipped classrooms in EFL contexts. These findings suggest the potential transferability of flipped learning benefits to Arabic language learning contexts. Despite these promising outcomes, scholars have also cautioned against certain limitations of the flipped learning approach. Chen et al. (2014) noted that the model requires significant preparation time for teachers, reliable access to technology for students, and readiness among both parties to adapt to new roles in the learning process. Moreover, when students lack self-discipline or motivation, the benefits of flipped learning may be diminished (Tafti & Yazdi, 2023; Mandasari & Wahyudin, 2021).

In the Jordanian context, recent curriculum reforms by the National Center for Curriculum Development (2024) emphasize the integration of modern teaching approaches that align well with the principles of flipped learning. These reforms encourage functional grammar instruction where students deduce grammatical rules through active participation rather than passive reception. Nonetheless, research focusing on flipped learning in Arabic grammar classrooms at the secondary level in Jordan remains limited.

Previous studies have predominantly examined higher education contexts or focused on general language skills without specifically addressing grammar (Abu Safiyeh & Farrah, 2020; Karabulut-Ilgu et al., 2018). Therefore, there is a clear need to investigate the specific impact of flipped learning on Arabic grammar instruction for secondary students in Jordan. The present study aims to address this gap by providing empirical evidence on the effectiveness of flipped learning in enhancing students' achievement in Arabic grammar and improving their attitudes toward learning. It also contributes to the ongoing dialogue regarding the pedagogical opportunities and challenges associated with implementing flipped learning across diverse educational settings.

3. Methodology

3.1. Research Design

The experimental design used in this study is visually presented in Figure 1. It demonstrates the assignment of students to either the experimental or control groups, the type of instruction they received during the second semester of the 2022/2023 academic year, and the subsequent administration of the achievement test.

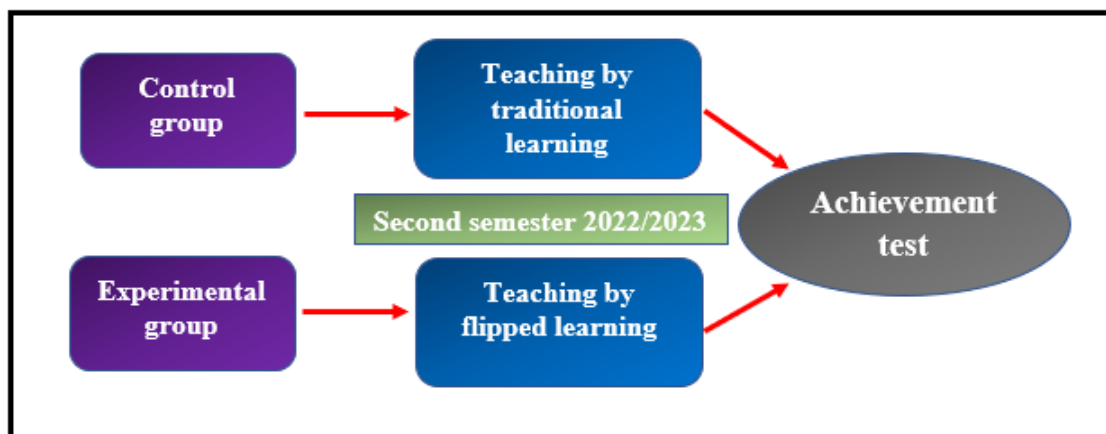


Figure 1. The Experimental Design was Applied in the Study (Alsalhi, 2020).

3.2. Participants and Sampling

The study sample consisted of 63 seventh-grade students enrolled at Al-Mazar Basic School, Ministry of Education, Karak, Jordan, who were divided into two groups: an experimental group of 32 students receiving flipped learning instruction, and a control group of 31 students receiving traditional instruction. Table 1 and Figure 1 present the demographic distribution of the participants.

Table 1. Presents the Demographic Distribution of the Participants.

Group	N	Instructional Method
Experimental	32	Flipped Learning
Control	31	Traditional Learning
Total	63	—

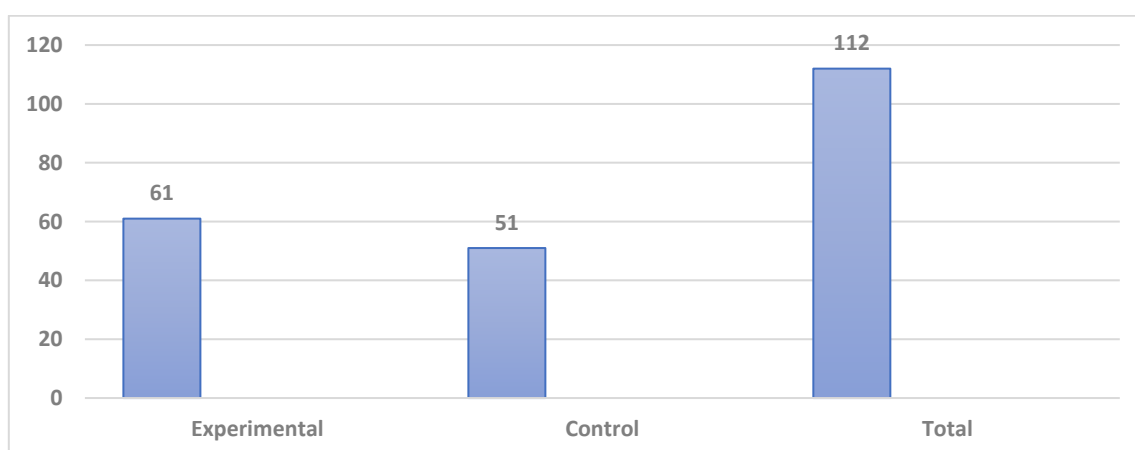


Figure 2. Participants' Number and Percentage in the Experimental and Control Groups.

The sampling method ensured that both groups were comparable in terms of academic level and learning environment prior to the intervention.

3.3. Instructional Procedures

The instructional procedures involved teaching Arabic grammar topics consistent with the official Jordanian curriculum, ensuring that both the experimental and control groups covered the same content over an equivalent time period. In the experimental group, students were provided with pre-recorded video lectures to review independently prior to classroom sessions. Classroom time was then devoted to interactive discussions, collaborative group work, and practical application activities designed to reinforce grammatical concepts. In contrast, the control group received instruction through conventional teacher-centered methods, where grammatical rules were explained directly by the teacher during class, followed by guided practice and exercises administered by the instructor.

3.4. Study Instruments

3.4.1. Achievement Test

A researcher-developed Arabic grammar achievement test was designed in accordance with Bloom's taxonomy and curriculum standards. The test consisted of 20 multiple-choice items covering seven grammar lessons. Each correct response was awarded one point; incorrect responses received zero. The maximum score was 20, and students had 60 minutes to complete the test.

- Content validity was established through expert review by six faculty members specialized in curriculum and instruction.
- Reliability was confirmed using test-retest methodology, yielding a Pearson correlation coefficient of 0.881, indicating high internal consistency.

3.4.2. Attitudes Questionnaire

A 20-item questionnaire using a 5-point Likert scale was developed to assess students' attitudes toward flipped learning. The questionnaire included two sections: (a) demographic information and (b) attitudinal statements related to flipped learning.

- Content validity was confirmed by six academic experts.
- Reliability was established using Cronbach's alpha, resulting in a coefficient of 0.803, indicating acceptable reliability.

3.5. Data Collection Procedure

The data collection process was carried out over the course of one academic semester. Initially, both groups completed a pretest consisting of the achievement test and the attitude questionnaire. Following this, the instructional interventions were implemented according to group assignments, with the experimental group receiving flipped learning and the control group receiving traditional instruction. Upon completion of the instructional period, a posttest was administered to both groups to assess changes in achievement and attitudes. All collected data were subsequently coded and anonymized to maintain participant confidentiality prior to conducting statistical analyses.

3.6. Assumption Testing

Before performing the inferential analyses, the necessary statistical assumptions were tested to ensure the validity of the results. The normality of data distribution was examined using the Shapiro-Wilk test, while the homogeneity of variances between the experimental and control groups was assessed using Levene's test to confirm the comparability of the groups.

3.7. Data Analysis

The data were analyzed using IBM SPSS Statistics (version 26). Independent-sample t-tests were conducted to compare achievement scores between the experimental and control groups, while paired-sample t-tests were used to assess differences in attitudes before and after the intervention within the experimental group. Levene's test was applied to examine the equality of variances between groups. Additionally, effect sizes were calculated using Cohen's d to determine the magnitude of the observed differences. All statistical tests were conducted at a significance level of $p < 0.05$.

4. Results

4.1. Results for Research Question 1:

How does the application of flipped learning influence students' achievement in Arabic grammar? To examine the differences between the experimental and control groups in terms of achievement in Arabic grammar, an independent-sample t-test was conducted.

Table 2. Descriptive Statistics for Post-Test Achievement Scores

Group	N	Mean (M)	Standard Deviation (SD)
Experimental	32	17.38	1.79
Control	31	16.19	2.26

The descriptive statistics in Table 2 show that the mean achievement score of the experimental group ($M = 17.38$, $SD = 1.79$) was higher than that of the control group ($M = 16.19$, $SD = 2.26$). To further analyze whether this difference was statistically significant, an independent-samples t-test was conducted.

Table 3. Independent-Sample t-Test Results Comparing the Experimental and Control Groups

Test	Levene's F	Sig.	t	df	Sig. (2-tailed)	Mean Difference
Equal variances assumed	2.070	0.155	2.305	61	0.012	1.1815
Equal variances not assumed			2.297	57.182	0.012	1.1815

The results in Table 3 indicate that Levene's test confirmed homogeneity of variances ($p = 0.155 > 0.05$). The independent-sample t-test revealed a statistically significant difference in achievement scores between the two groups ($t(61) = 2.305$, $p = 0.012$). The experimental group significantly outperformed the control group. Furthermore, Cohen's d was calculated to estimate the effect size:

$$d = \frac{\text{control}M_{exp} - M}{\text{pooled}SD} = \frac{16.19 - 17.38}{\sqrt{\frac{(2 \cdot 2.26^2 + 2 \cdot 1.79^2)}{2}}} \approx 0.59$$

This value ($d = 0.59$) indicates a moderate effect size, suggesting that flipped learning had a meaningful positive impact on students' achievement in Arabic grammar. These findings demonstrate that students who received instruction through flipped learning achieved higher scores in Arabic grammar compared to their peers in the traditional learning group. The interactive and

student-centered nature of flipped learning likely contributed to better comprehension and retention of grammatical concepts.

4.2. Results for Research Question 2:

What are the attitudes of students in the experimental group toward the use of flipped learning in teaching Arabic grammar? To assess changes in students' attitudes before and after exposure to flipped learning, a paired-sample t-test was conducted.

Table 4. Descriptive Statistics for Attitudes Towards Flipped Learning (Pre- and Post-Test)

Measurement Time	N	Mean (M)	Standard Deviation (SD)
Pre-application	32	1.79	0.262
Post-application	32	3.33	0.545

As shown in Table 4, the mean score for students' attitudes toward flipped learning increased from 1.79 before the intervention to 3.33 after its implementation.

Table 5. Paired-Sample t-Test Results Comparing Pre- and Post-Attitudes

t	df	Sig. (2-tailed)
11.869	31	0.000

The paired-sample t-test results in Table 5 indicate that the difference in attitudes was statistically significant ($t(31) = 11.869, p < 0.001$), reflecting a considerable improvement in students' attitudes towards flipped learning after experiencing it. The effect size (Cohen's d) was calculated to determine the magnitude of this change:

$$d = \frac{\text{control}M_{exp} - M}{\text{pooled}SD} = \frac{1.79 - 3.33}{\sqrt{\frac{(20.262 + 20.545)}{2}}} \approx 2.10$$

A large effect size ($d = 2.10$) indicates that the flipped learning experience had a substantial positive impact on students' attitudes. These findings suggest that exposure to flipped learning significantly improved students' perceptions and satisfaction with this instructional approach. The interactive, technology-enhanced, and student-centered environment likely contributed to this positive shift in attitudes.

5. Discussion

The findings of this study provide strong empirical support for the positive impact of flipped learning on both students' achievement in Arabic grammar and their attitudes toward the learning process. The notable improvement in the experimental group's post-test scores compared to their peers in the control group is consistent with prior research highlighting the effectiveness of flipped learning in boosting academic outcomes (Amini et al., 2022; Bishop & Verleger, 2013; O'Flaherty & Phillips, 2015). The flexibility offered by this approach, where students can engage with instructional content before class and apply their knowledge through collaborative activities during class time, appears to enhance understanding and retention of grammatical structures. This learner-centered design fosters deeper conceptual engagement, promotes critical thinking, and provides timely feedback, all of which are often lacking in traditional teacher-led classrooms (Karabulut-Ilgu et al., 2018; Chen et al., 2014). Moreover, the significant increase in students' positive attitudes toward

flipped learning reflects its potential to motivate and actively involve learners. These results align with previous studies (Steven, 2022; Mostarihi, 2014), which found that students responded favorably to modern instructional strategies that offered autonomy, interactivity, and meaningful use of technology. Supporting this, Alsalhi et al. (2021) found that implementing differentiated instruction in science classes resulted in measurable gains in student achievement and attitudes, underscoring the broader value of personalized and student-responsive teaching models, such as flipped learning. In parallel, the work of Shudayfat and Alsalhi (2023) demonstrated how immersive 3D virtual environments in science education can enhance both learning and learner engagement. This suggests that when students are exposed to dynamic and interactive digital platforms, their motivation and academic outcomes improve, findings that echo the results of the present study. Furthermore, in higher education contexts, Eltahir et al. (2022) reported that students positively accepted the use of electronic assessments during the COVID-19 pandemic. This indicates a broader readiness among learners to engage with technology-driven instructional models, highlighting the value of flipped learning in aligning with contemporary educational needs. While these results are promising, it is essential to recognize that the successful adoption of flipped learning relies on thoughtful implementation, adequate technological infrastructure, and effective teacher preparation. As emphasized by Abeysekera and Dawson (2015) and Smith (2018), professional development and institutional support are essential for ensuring that educators can design pedagogically sound flipped classrooms that are effectively integrated into the curriculum.

6. Limitation

Although the findings of this study provide valuable insights into the impact of flipped learning on students' achievement in Arabic grammar and their attitudes, certain limitations should be acknowledged. The study was conducted on a relatively small sample of seventh-grade students from a single school in Jordan, which may limit the generalizability of the results to broader populations or different educational contexts. Furthermore, the study's focus was restricted to Arabic grammar; therefore, the outcomes may not necessarily extend to other language skills or academic subjects. The duration of the intervention was also relatively short, which may not have allowed for the full exploration of the long-term effects of flipped learning on students' academic development. Additionally, the study relied on students' self-reported data to measure their attitudes toward flipped learning, which may be influenced by social desirability bias. Recognizing these limitations is essential for guiding future research efforts that seek to build upon the current findings and expand the evidence base for flipped learning in diverse educational settings.

7. Recommendations

In light of the study's findings, several recommendations can be proposed to enhance the effective integration of flipped learning into educational practice. Educational institutions should prioritize the provision of professional development programs that equip teachers with the necessary skills to design and implement effective flipped learning models, ensuring that these models are closely aligned with curriculum standards and learning objectives. Moreover, schools and education authorities should invest in the development of technological infrastructure and offer consistent technical support to both teachers and students to facilitate the smooth application of flipped learning approaches. Future research is also recommended to explore the impact of flipped learning on a broader range of subjects, educational levels, and diverse student populations, in order to gain a more comprehensive understanding of its benefits and challenges. Finally, curriculum developers are encouraged to consider incorporating flipped learning strategies into national curriculum frameworks, particularly in language education, as a means of promoting more engaging, student-centered, and technology-integrated learning environments that respond to the evolving demands of the digital age.

Declarations

Conflicts of Interest. The authors declare no conflict of interest.

Funding. The authors confirm that no funding was received for conducting this study.

Data Availability Statement. The corresponding author's data supporting this study's findings are available upon request.

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