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Enhancing grammar instruction for EFL secondary school students: Leveraging the flipped approach as a pedagogical intervention

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While flipped learning is a commonly applied pedagogical intervention, a careful review of empirical studies provides little evidence of its effectiveness in facilitating students' grammar learning at the secondary school level in English as a foreign language (EFL) contexts. Unlike traditional grammar teaching methods that emphasize rule explanation and mechanical drills, flipped instruction promotes a deeper understanding of grammar through learning enhancements such as interactive tasks and personalized support. To contribute to this line of inquiry, the current study investigates the role of a pedagogical grammar intervention that leverages the flipped classroom model as an instructional space for improving students' grammar performance at a secondary school in Kazakhstan. A pre-test and post-test quasi-experimental design was employed to examine the extent to which this intervention affected students' ($N = 104$) English grammar learning. The results revealed that students in the experimental group who experienced flipped instruction made greater progress in learning grammar ($d = 0.81$) than those exposed to conventional pedagogy. The findings suggest that the flipped classroom worked as a useful delivery platform to facilitate the integration of enhancements that offer students greater time on task, diverse learning experiences, and social engagement. Leveraging the flipped approach also freed up teacher instructional time to spend less time on direct instruction

and more on designing collaborative and interactive materials, such as jigsaw activities, guessing tasks, and board games. The paper concludes with implications for future research and practice concerning the integration of emerging technological affordances into language learning classes in secondary schools.

Keywords: Flipped classroom model, English grammar, EFL learners, high school students, Kazakhstan

Introduction

Sufficient knowledge of grammar is instrumental in helping language learners make sense of a wide range of language use patterns and achieve communicative goals in different situations and modes (Ellis & Shintani, 2014; Larsen-Freeman, 2015). By providing a framework for organizing linguistic segments into coherent, meaningful units, effective knowledge of grammar enables language learners to convey their ideas with greater accuracy and clarity. In other words, knowledge of grammar serves as the structural foundation for language learners to effectively express themselves in language (Brown, 2014; Thornbury, 2016). However, language education, and particularly grammar instruction in English as a foreign language (EFL) contexts, has been heavily influenced by inadequate traditional curricular policies and ineffective pedagogical practices. Teachers in such contexts generally allocate a considerable amount of class time to lecturing on grammar rules and reinforcing their uptake through mechanical drills and exercises (Naghdipour, 2021, 2025; Castañeda & Cho, 2016; Moghari & Marandi, 2017).

Informed by the sociocultural theory of knowledge development (Vygotsky, 1978) and the widespread influence of communicative language teaching (CLT) approaches, however, teaching grammar has been transformed from emphasizing memorization of rules and exceptions to active and effective communicative activities (Hummel, 2014; Ritchhart et al., 2011). Communicative language teaching underscores interaction and communication as key objectives of language learning to help students acquire English for authentic use in real-life situations (Huang et al., 2017; Thornbury, 2016). Since traditional classroom instruction is less likely to provide students with learning spaces conducive to using grammar in communicative situations, teachers have utilized technological tools to make learning grammar more engaging and stimulating (Pawlak, 2021). Among such tools, video creation and sharing have become effective teaching tools for adopting CLT in language education (Chen Hsieh et al., 2017; Turan & Akdag-Cimen, 2019). With the sophistication of online video platforms and screencasting technologies, instructional materials developers and teachers have found it easier to record lectures and share them with students before class meetings (Jiang et al., 2022; Turan & Akdag-Cimen, 2019; Van Alten et al., 2019).

This shift in directing instruction outside class has led to the rise of the flipped classroom model. Flipped learning integrates pre-recorded video technology into language learning lessons to engage students in instructional

materials before attending and participating in classroom-based activities (Chuang et al., 2018; Lai, 2023; Pang, 2022; Van Alten et al., 2019; Webb & Doman, 2016). Generally speaking, the flipped classroom is an active learning approach in which classroom-based instruction and independent learning beyond the classroom are inverted to enhance student learning (Jaramillo, 2019; Jong et al., 2019; Tanaka-Ellis & Sekiguchi, 2019). By allowing students to engage with instructional videos outside class, the flipped classroom model frees up valuable face-to-face time for teachers to incorporate and guide discussions and other collaborative language learning activities in the classroom (Chen Hsieh et al., 2017; Mazur et al., 2015; Tanaka-Ellis & Sekiguchi, 2019). When combined effectively, the flipped model and classroom-based instruction could represent a promising alternative to traditional grammar teaching (for a review of traditional vs. updated pedagogical approaches employed in Kazakhstan, see Courtney et al., 2022, and Zholyimbekova et al., 2024). Although previous research in EFL contexts (e.g., Afzali & Izadpanah, 2011; Al-Harbi & Alshumaimeri, 2016; Al-Naabi, 2020; Meléndez & Iza, 2017; Noroozi, 2022; Pudín, 2017; Singay, 2020) has reported promising results concerning the incorporation of the flipped classroom model in grammar instruction, some of these studies suffer from methodological flaws in their design (Strelan et al., 2020; Turan & Akdag-Cimen, 2019). In particular, they mostly used a small, non-random sample, did not include a control group, or were concerned with other aspects of grammar instruction such as students' or teachers' attitudes toward pre-recorded lessons or the whole approach to learning.

To address these gaps, the current study investigates the extent to which students in secondary schools in Kazakhstan can improve their English grammar using the flipped classroom model as a pedagogical space that facilitates the integration of a bundle of learning enhancements into instruction. Compared to previous research, this study employs a quasi-experimental design, a moderate sample size, and a targeted selection of grammatical points in a naturalistic, ecologically viable context of a secondary school where students study English as a foreign language. The findings could contribute to ongoing debates on the effectiveness of technology-supported, interactive pedagogical approaches to teaching grammar. This would in particular benefit secondary school teachers and curriculum designers in Kazakhstan and similar EFL contexts who are seeking step-by-step guidelines on flipping one of the most daunting aspects of language learning. For students who are mostly familiar with in-person traditional grammar-translation language learning methods (Naghdipour, 2021, 2025; Castañeda & Cho, 2016; Moghari & Marandi, 2017), learning at their own pace and style would be highly likely to allow them to more effectively monitor and manage their learning (Mohanty & Parida, 2016).

Theoretical background

This section draws on constructivist learning theory, sociocultural theory, and Bloom's taxonomy to establish the theoretical underpinnings of the flipped learning model in language education. Informed by constructivist learning theory, the flipped learning model supports creating an engaging instructional space that promotes learning (Cheng et al., 2019; Webb & Doman, 2016; Xu & Shi, 2018). The essential components of the constructivist approach include the learning environment, discourse, collaboration, and instruction focused on meaning (Phillips, 1995). These components create a learning space that encourages students to be enthusiastic about learning and take initiative to move forward. The flipped classroom model relies on these components to engage students in interactive and collaborative activities to help them apply their knowledge and negotiate their learning problems or misunderstandings. Teachers, for example, can utilize digital content or online resources to help students review and analyze materials at home, allowing for more interactive and problem-solving activities to take place in the subsequent class to foster creativity among students (Martin, 2012; Van Alten et al., 2019). In doing so, teachers assume the role of facilitators and supervisors whereas students become active participants and central agents in the cognitive process of learning (Xu & Shi, 2018). By incorporating effective scaffolding, sharing interactive exercises, and offering timely feedback, students can focus on fundamental knowledge of grammar outside class and interact with their teacher and peers face-to-face to contextualize grammar using more practical activities (Li et al., 2017).

Incorporating the flipped learning model in language education is also espoused by the sociocultural theory of knowledge development. This theory revolves around the notions of mediation and interaction with technological artifacts and competent others (Ellis, 2003). More specifically, Vygotsky (1978) emphasized the crucial role social interactions play in the advancement of human cognitive abilities or how mental processes are mediated and shaped by cultural artifacts, concepts, and activities. Language learners can, for example, interact with technological tools to regulate and internalize their learning (Lantolf & Thorne, 2006). They can also move from dependence on interacting with different language learning mediators to a stage where they can independently address their own learning problems within the next level of performance or what Vygotsky (1978) labeled as the zone of proximal development (ZPD). This zone of development assumes that cultural tools can enable people to regulate and transform their knowledge as well as behavior. To help students close the divide between their current and next level of knowledge and skill development, teachers should design and implement various scaffolding strategies or activities in their classes. A flipped classroom has the potential to offer opportunities and affordances for scaffolding language learning by augmenting students' interaction and exposure to key aspects of language learning such as grammar and structure.



To enhance knowledge construction through scaffolding, teachers may also adopt Bloom's taxonomy framework (Anderson & Krathwohl, 2001) in designing flipped learning as a flexible approach to achieving learning outcomes and skill development (Jiang et al., 2022). In traditional language learning classes, a substantial amount of in-class time is usually devoted to completing lower-order learning exercises such as memorizing and understanding vocabulary and grammar (Bergman & Sams, 2012; Ouda & Ahmed, 2016). In other words, teachers often neglect the higher-order thinking skills of analyzing, evaluating, and creating, or assign them for independent work outside class. By contrast, flipped learning ensures that language learners move from understanding basic concepts by reviewing instructional materials at home to developing more sophisticated cognitive abilities such as knowledge construction and skill building in the classroom (Davis, 2016). Grasping the fundamental aspects of a lesson before class through watching, reading, and reviewing basic concepts can free up in-class time for participating in different interactive and collaborative activities to develop higher-level skills (Bergmann & Sams, 2012; Chen Hsieh et al., 2017; Mehring, 2018). By maximizing active learning, flipped pedagogy also allows for discovery-based learning, where students are presented with challenging and stimulating problem-solving tasks to complete in the classroom while benefiting from timely feedback and scaffolding from peers and teachers (Bergman & Sams, 2012). Thus, when applied thoughtfully, flipped learning reverses Bloom's taxonomy to promote knowledge construction and help students become independent, lifelong learners.

To sum up, sociocultural theory closely complements communicative language teaching (CLT) through their mutual emphasis on interaction and meaning-making in language learning. While CLT promotes authentic communication through tasks like discussion and role-play (Savignon, 2002), sociocultural theory explains how learners develop linguistic competence through social mediation and scaffolding within the zone of proximal development (Vygotsky, 1978; Lantolf & Thorne, 2006). In a flipped classroom, this connection is strengthened as learners prepare individually and then engage in communicative, collaborative activities that promote both fluency and cognitive growth.

Flipped learning and English grammar instruction

Despite the potential of incorporating the flipped learning model in EFL grammar classes, a careful review of the research evidence for its relative effectiveness is scarce. Few studies conducted in this area have predominantly stressed the potential of flipped learning to improve students' grammar knowledge and performance in exams or tests. For example, Al-Harbi and Alshumaimeri (2016) found that flipping grammar lessons for secondary school students enhanced their performance in grammar tests. In addition, they reported that students exhibited positive attitudes toward adopting the flipped classroom model for teaching grammar. In another study, Melendez and Iza (2017) reported that the flipped method increased students' abilities to acquire grammatical concepts

while engaging in other language learning activities. Similarly, Ishikawa et al. (2019), who investigated strategies to enhance the participation level of Japanese learners in carrying out e-learning activities on the Test of English for International Communication (TOEIC), reported that deploying a flipped learning model could potentially enhance students' grammatical skills.

Previous research also suggested that flipped pedagogy had a favorable effect on language learners' motivation, engagement, and collaboration to boost their understanding and knowledge of grammar. In particular, language learners generally exhibited positive attitudes toward the instructional strategies employed in the flipped classes and viewed this pedagogical practice as a more productive and engaging approach to learning (Al-Naabi, 2020; Bishop & Verleger, 2013; Erbil, 2020; Xu & Shi, 2018). Al-Naabi (2020), for example, concluded that flipped instruction favorably affected EFL intermediate students' engagement and motivation in grammar learning. Having used semi-structured interviews to investigate how a flipped classroom model could affect different aspects of students' language learning, Singay (2020) also found that flipped instruction created an amiable learning environment. Additionally, students in this study reported positive attitudes toward incorporating technological tools, better relationships with their teacher, and effective collaboration with peers.

Since flipped learning, as a technology-enhanced pedagogy, generally involves preparing students for class by watching pre-recorded lectures or videos outside class, it can foster student learning autonomy and agency (Li, 2016; Santos & Serpa, 2020). Simply put, as teachers do not carry the entire responsibility of teaching, learning looms large in educational spaces where flipped learning models are implemented (Jacobs & Toh-Heng, 2013). The flipped classroom's efficacy seems to stem from students assuming accountability for their self-directed learning by viewing instructional materials before attending class (Mehring & Leis, 2018; Turan & Akdag-Cimen, 2019; Webb & Doman, 2016). Thus, it is suggested that students' participation in self-governing learning could lead to a heightened awareness of their strengths and challenges, as well as potential insights into how to address these inadequacies through in-class activities.

While more recent research has reported positive and significant results concerning the use of flipped learning interventions in students' grammar development, these studies seem to suffer from design issues such as small sample size, lack of a comparative control group, and inadequate evidence of reliability and validity of data collection instruments (Strelan et al., 2020; Turan & Akdag-Cimen, 2019). As an example, Anggoro and Khasanah (2022) reported that students who were exposed to flipped instruction made substantive improvements in their English vocabulary, grammar, and reading. However, they cautioned that their results should be interpreted with care due to a small sample size of 32 students and lack of a control group. More recently, Rad (2023) used a quasi-experimental design to examine the rate at which students in both experimental and control groups developed their understanding of grammatical concepts over 11 weeks. The author reported that the experimental groups (micro, flipped, and micro-flipped learning cohorts) exhibited

significantly larger improvements in test scores compared to students in the regular classes. However, the pre-test and post-test in this study covered completely different sections of a grammatical course book, making any assertion about actual improvement problematic.

In Kazakhstan, as the context of this study, previous work on the incorporation of the flipped learning classroom focused primarily on school subjects such as science (Koshegulova & Mindetbay, 2020), other aspects of language learning (Yudintseva, 2016), or post-secondary education (Rakhimzhanova, 2016). Thus, to contribute to this line of inquiry and address design flaws in related research, this quasi-experimental study intends to address the following research question: “Compared to the traditional language learning pedagogy, to what extent can leveraging flipped grammar instruction help EFL high school students improve their learning?”

Methods

Participants

Four groups of 9th-grade students (28 females and 35 males) were assigned to flipped classroom instruction, while three groups (26 females and 15 males) experienced learning English grammar through the traditional in-person pedagogy without incorporating technological tools into lessons. Notably, the different proportion of males and females in the two groups was not deemed statistically significant ($\chi^2[1] = 2.86, p = .09$; Yates' continuity correction applied; note that gender is not considered a primary variable in this study, but we deemed its potential effect important to check. In addition, the intraclass correlation coefficient (ICC) statistic, representing the proportion of variance in student pre-test ability (θ_1) attributable to classes, was slightly under .10 (*design effect* = 2.26), suggesting that student grammatical ability at the pre-test stage did not vary substantially for the different classes. Furthermore, all participating students started learning English formally in school from the 1st grade. Based on the criteria established by the Common European Framework of Reference for Languages (CEFR), as the widely recognized standards for describing learners' language ability, most had reached the mid-B1 level at the end of the 8th grade. They were all Kazakh nationals, ranging in age from 15 to 16 years old, and enrolled in a gymnasium, a type of public school located in the Central region of Kazakhstan. Founded in 1972, the gymnasium was one of the top mainstream schools in Karaganda city at the time this study was carried out. It was granted gymnasium status in 1996 as a school with Russian as the medium of instruction. A total of 1,202 students were studying at this school, and out of this population, seven 9th-grade classes (constituting 104 students) participated in the current study. The content of grammar lessons taught and assessed in both the flipped and traditional classes was closely connected with the CEFR. The textbook used for this purpose was *English plus Kazakhstan* (Pye & Wetz, 2018), and the areas covered included past simple and past continuous tenses, first and second conditionals, and active and passive voice (MoES, 2022).

Data collection

To assess their knowledge of English grammar before the intervention, a grammar test was administered to participating students in both experimental and control groups in week 1. After the eight-week intervention period (15 lessons), a post-test was also administered to the same students under equal conditions to determine their level of improvement in English grammar. The pre-test and post-test instruments each contained 40 items and covered past simple and past continuous tenses, first and second conditionals, and active and passive voices. The first and second authors prepared the items on the pre-test and post-test, relying on the sources that covered the same topics as suggested by the course learning outcomes. These tests were designed in a multiple-choice format to evaluate not only lower-level but also higher-level cognitive skills (Blerkom, 2009). Specifically, the pre- and post-tests were designed to measure both lower- and higher-level ability in English grammar. For example, the 1st conditional was considered easier for students than the 2nd conditional or past simple vs past continuous. In general, grammar themes were chosen based on the instructional content considered for the 9th-grade classes (see Appendix A for sample test items). Notably, a counterbalanced approach was ultimately used in the following term whereby students experienced the counter condition to ensure fairness.

To account for the ethical issues, the lead researcher (and teacher) discussed the research project with the school's principal. After securing the permission, she attended the teacher-parent meeting to provide a detailed explanation of the flipped classroom instruction. Parental consent forms were then handed over to students' parents, and their questions and concerns were addressed to assure them of the measures taken to avoid the compulsory participation of students in the study. It was mentioned that the test regime was no different from what would usually be administered for that grade. Parents were also informed that the provided videos would be matched to students' proficiency level and accompanied by the appropriate amount of task instruction based on the curriculum requirements. Assent scripts were distributed to students, which clarified their agreement to participate. Given the anonymous nature of the demographic questions and associated tests, respondents could withdraw their contributions at any time during the course of the study. Finally, it is important to note that, as part of school policy, school administration allocated students to EFL classes randomly and that no form of streaming was employed in the EFL program. Moreover, the assignment of each class to the experimental (flipped) and control (traditional) groups was associated with the number of classes that each respective teacher was contractually required to teach that academic year.

Instruction

The lead researcher taught the flipped class groups (the experimental groups) covering the same grammatical lessons mentioned above. Aligned with the goals of the curriculum, the teacher created the content of the videos on the

same topics as included in other instructional materials. She shared the videos with students via a WhatsApp account for each group, one or two days before the scheduled class. WhatsApp was chosen for its potential as a widely used mobile-based social media platform offering various features (Arifani et al., 2020). At the time this study was carried out, Kazakhstani students frequently used this application for personal and educational purposes. Previous research in this area (e.g., Ahmad et al., 2020; Noroozi et al., 2020) also reported the use of WhatsApp as a popular technology for sharing grammar lessons with students in flipped learning classes. The teacher utilized the PowerPoint program to present the materials in a visual format and recorded the videos using the Zoom platform. The duration of the videos ranged from 2:50 to 4:30 minutes. They mostly contained slides with pictures and corresponding grammar explanations. The teacher's presence in the tutorial videos aimed at encouraging and motivating the students for further engagement. The videos were also organized to be seamlessly integrated into the lessons, as they were highly focused and accompanied by the teacher's assigned tasks (Table 1).

The teacher in the flipped class groups required students to watch the videos attentively, complete relevant tasks, and share comments or questions in the class WhatsApp group. At the beginning of each lesson, students were given a quiz as a formative assessment strategy (Black & Wiliam, 2018) to assess their comprehension and preparedness levels and determine their familiarity with the shared materials. Various communicative activities were introduced to help students apply their grammar knowledge in real-life scenarios. Some of these activities included Jigsaw, Venn diagrams, pair work dictations, debates, guessing games, and board games. In general, in-class time was devoted to engaging students in interactive activities, with the teacher taking on a supportive role in the classroom. While students attempted to complete the tasks, the teacher observed and assisted students by moving around and answering their inquiries. Implementing the flipped model was not, however, without challenges. Preparation of video materials was a time-consuming task, and to address this challenge, ready-made materials were also used. It is worth noting that not all students reviewed flipped materials and came to class fully prepared. Some were partially prepared. Preliminary tests were therefore used to check students' preparedness at the beginning of each session.

By contrast, students in the control groups, who were taught by another teacher, received traditional grammar instruction. The teacher presented a new lesson in class on the same grammatical concepts that the flipped learning groups experienced. Students then completed grammar exercises without any technological support. Notably, activities in the control group centered around the completion of worksheets that focused on translating sentences, identifying grammatical structures from example excerpts, and producing short written texts. Scholars generally agree that traditional grammar instruction follows the PPP (Presentation, Practice, and Production) sequence, where teachers present grammatical structures in sequence, deploy exercises for students to practice the newly presented items, and get them to produce them in controlled situations through writing or speaking (Pawlak, 2021). Although the definition of

traditional might vary from one context to another, depending on differences in curricular policies and sociocultural and historical factors, in this study, the teacher explained the grammatical structures (Present) and deployed translation and grammar identification exercises (Practice), followed by writing short answer questions (Production). Finally, it is important to note that the time that students devoted to learning grammatical concepts in the flipped classroom likely exceeded the time that students devoted to learning grammatical concepts in the traditional classes. A discussion of the limitations of this is provided in the Discussion section of this manuscript.

Table 1. Video topics and length used in the flipped classroom

Video	Topic	Length (minute: second)
Video 1	First conditional	4:30
Video 2	Second conditional	3:00
Video 3	First & second conditional	3:50
Video 4	Past simple (active voice)	3:05
Video 5	Past progressive (active voice)	3:00
Video 6	Past simple & past progressive	2:30
Video 7	Present simple & past simple (passive voice)	3:06
Video 8	Future simple passive	3:02
Video 9	Present & past progressive (passive voice)	2:50
Video 10	Transformation of active forms into passive (revision)	3:10

Data analysis

To account for the face validity of the grammar test, all items were reviewed by a subject matter expert prior to administration. This review ensured that each item was well aligned with the goals of the national curriculum. We then used classical test theory (CTT) and Rasch modeling to analyze the collected item-response data. In particular, we relied on alpha-if-deleted coefficients, the item-rest correlations, Cronbach's alpha reliability, and the standard error of the mean to check test reliability. All analyses were conducted using the R packages, CTT (Willse, 2018), and TAM Rasch analysis for equating (Robitzsch et al., 2022) (R code available from the corresponding author). Based on the analyses of the flipped and traditional combined item-response matrices, no poorly functioning items (i.e., negative item-rest correlation coefficients) were removed. This meant that the tests exhibited sound psychometric properties, ensuring valid growth estimates for the study. After generating pre-test (θ_1) and post-test (θ_2) ability estimates for each student, we performed two separate independent sample *t*-tests (or non-parametric equivalent) to check for group differences at each time point.

However, to determine the growth in students' grammatical ability, the ability estimates gained from the pre-test were subtracted from those of the post-test ($\theta_2 - \theta_1$). This process put forward a growth estimate (θ_g) for each individual

student in the study, i.e., a measure that reflects the degree to which each student improved for the study period (technically, a type of standardized measure of improvement for each student). For the main analysis, an independent sample *t*-test (or non-parametric equivalent) was planned with alpha set to .05 to determine whether the difference between growth estimates of experimental and control groups was statistically significant. Additionally, Cohen's *d* effect size was used using *effsize* package's *cohen.d* function (with 0.20, 0.04, and 0.60 considered small, medium, and large; Hattie, 2008) to calculate and interpret the practical significance of the difference in growth between the experimental and control groups.

Results

After reviewing and approving the alignment of the items with the national curriculum and its goals, and meeting the requirement of face validity, we performed the analysis of the test reliability to ensure that all of the items functioned well (Table 2). The results indicated that all item-rest correlations for the pre-test (both groups: $r = .04$ to $.62$) and the post-test (both groups: $r = .14$ to $.51$) were positive, which suggests that each test item contributed positively to the estimation of student performance in grammar. In addition, all item-if-deleted coefficients were lower than the respective standard alpha for each of the pre- and post-test item-response matrices also suggestive of adequate reliability.

Table 2. Descriptive and reliability estimates for pre-test and post-test

Condition	Number of items	M (SD)	Cronbach's Alpha	Rasch Reliability
Pre-test				
Flipped	40	22.94 (9.07)	.909	.901
Traditional	40	24.66 (6.50)	.813	.823
Total	40	23.62 (8.16)	.885	.880
Post-test				
Flipped	40	24.37 (7.77)	.875	.878
Traditional	40	19.46 (7.43)	.846	.839
Total	40	22.43 (7.97)	.873	.874

Prior to comparing means at the pre-test (Table 3), a homogeneity of variance (Levene's Test) test and a normality (Shapiro-Wilk) test were conducted on the initial outcome of interest and student grammar ability at the pre-test (θ_1). While the normality test was not violated ($W = 0.99$, $p = .358$), the homogeneity of variance test was violated ($F[1, 102] = 5.813$, $p = .018$). Therefore, the alternative test, the Welch two-sample *t*-test, was deemed appropriate. The results suggested that differences between the means of the two groups at the pre-test were not statistically or practically significant: $t(100.45) = -0.931$, $p = .354$, Cohen's $d = -.18$ (negligible). Having demonstrated an equivalent level of

student ability for the two groups at the pre-test, we then compared the level of *growth* in student ability for the experimental and control groups.

The same analytical approach was performed for the post-test results, i.e., θ_2 (Table 4). While the test of homogeneity of variance was not violated ($F[1, 102] = 0.321, p = .573$), the normality test was violated ($W = 0.965, p = .008$). Therefore, the alternative test, the Wilcoxon-Rank Sum Test, was applied. The results of this analysis suggested a statistically significant difference in the mean grammatical ability of students at the post-test: $W = 859.5, p = .004$ ($d = .65$, large). Specifically, the students exposed to flipped learning did better.

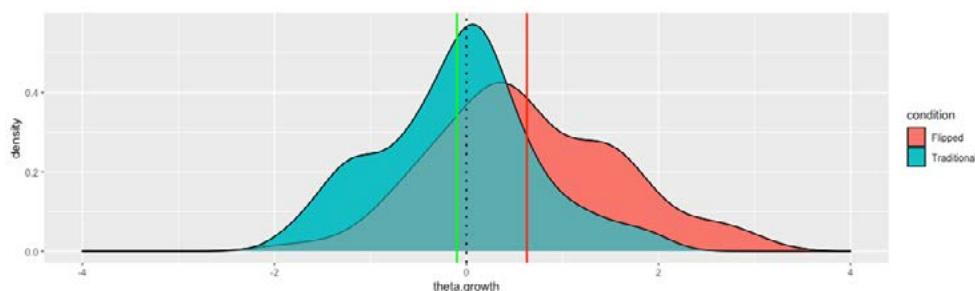
Table 3. Descriptive statistics of the pre-test English grammar ability

Test	<i>M</i>	<i>SD</i>	Skew	<i>d</i> ($M_{flipped} - M_{trad.}$)
Pre-test (Flipped)	-0.06	1.07	0.21	-.18
Pre-test (Traditional)	0.11	0.78	0.69	-
Overall	0.01	0.97	0.24	-

Table 4. Descriptive statistics of the post-test English grammar ability

Test	<i>M</i>	<i>SD</i>	Skew	<i>d</i> ($M_{flipped} - M_{trad.}$)
Post-test (Flipped)	0.570	0.914	0.607	.65
Post-test (Traditional)	0.010	0.782	0.441	-
Overall	0.01	0.97	0.24	-

Finally, to answer the main research question in this study, an estimate for the growth in student grammatical ability (θ_g) was computed by subtracting the pre-performance ability estimates from the post-performance ability estimates ($\theta_{[SUBSCRIPT_2]} - \theta_{[SUBSCRIPT_1]} = \theta_g$) for all students. Prior to comparing mean growth for each condition, a homogeneity of variance test (Levene's Test) and a normality test (Shapiro-Wilk) were conducted on the outcome of interest, growth in student ability (θ_g). While the homogeneity of variance test was not violated ($F[1, 102] = 1.020, p = .315$), the normality test was violated ($W = 0.985, p = .299$). Therefore, the standard independent sample t-test was applied to the data. The results suggested that the difference in the mean level of growth of the two groups was statistically significant: $t(1, 102) = 4.016, p < .001$. The mean growth for the flipped learning group was 0.63 and the mean growth for the control group was -0.10 with an associated Cohen's d of 0.81 (large; i.e., the overall difference in growth rate). Figure 1 provides a visual illustration of the comparative growth in grammatical ability of the two independent groups.



Note. The red thick line = mean growth in ability for the flipped group ($\bar{\theta}_g = 0.63$); the green thick line = mean growth in ability for the traditional group ($\bar{\theta}_g = -0.10$); the black dotted line represents the case for which there might exist zero mean growth in ability.

Figure 1. Comparative growth in student grammatical ability for traditional and flipped groups

Discussion

This study aimed to investigate the impact of flipped instruction as a delivery platform to improve grammar learning among EFL secondary school students. The results of grammar tests administered to both experimental and control groups at the beginning and end of the intervention suggest that the flipped approach had a practically and statistically significant effect on students' *rate* of improvement in English grammar. Although both groups covered the same grammar points over the same number of classroom hours, the flipped instruction as a teaching and learning space provided students with opportunities to engage with grammar at various stages: they watched teacher-made short videos, reviewed them at home, took quizzes as a formative assessment mechanism, discussed their problems both in class and beyond, collaborated with peers, and played games to practice their newly learned grammatical points. As a result of having more resources, support, interaction, and dedicated time, students benefited from a higher level of engagement with instructional materials catering to varied learning styles compared to their counterparts, who were exposed to lectures on grammatical rules and structures, practiced them through working on teacher-controlled exercises, and produced short texts to reinforce their learning. Although the results are consistent with previous empirical studies in secondary schools in similar contexts (e.g., Afzali & Izadpanah, 2011; Al-Naabi, 2020; Meléndez & Iza, 2017; Pudín, 2017; Singay, 2020), this study contributes to this area of inquiry by providing methodologically rigorous support for the leveraging of the flipped classroom model to deploy a package of enhancements for improved grammar performance. With a robust research design that included a moderate sample size, a control group, and valid and reliable data collection and analysis procedures, this study addressed a gap in current research, which has predominantly focused on other aspects of grammar instruction or lacked comparative analysis.

In particular, the flipped delivery likely created opportunities for the experimental group to spend more time engaging with the materials. This group of students benefited from watching and re-watching short videos, which provided a significant amount of pre-class exposure to grammar or linguistic input.

Students were also given opportunities to participate in cognitively demanding instructional activities such as games and dialogues during lessons (Cheng et al., 2019; Webb & Doman, 2016; Xu & Shi, 2018). This practice aligns with teaching grammar through communicative language teaching, which supports the use of instructional time on meaningful communication and interaction in language learning classes. During the intervention, students had sufficient time for meaningful interaction with the designed scaffolding activities. As mentioned, scaffolding is key to the concept of the Zone of Proximal Development (Cheng et al., 2019; Xu & Shi, 2018), which suggests that students should be engaged in iterative learning strategies to facilitate their transition into the next developmental stage of learning. It is thought that flipped instructional designs can function as suitable learning spaces to encourage scaffolding. In this study, this was achieved by dividing the class into groups of mixed abilities, requiring them to analyze and discuss different tasks. In this way, less competent students had opportunities to learn from more competent peers in a more relaxed and less stressful learning environment. This combination of student-centered pedagogy and teacher-led in-class activities supports constructivist theory whereby the teacher works as a facilitator to provide learners with student-centered activities and ensures their active participation in the learning environment (Li et al., 2017; Xu & Shi, 2018).

Another key component of the enhancements enabled by flipped instruction that could have helped achieve the observed learning outcomes was the quality of teacher-created instructional materials, mainly the short videos, and the channel of communication for their delivery and follow-up support. As mentioned earlier, it is not only crucial to have a proper balance of online and face-to-face materials for students, but it is also important to pay attention to the quality and length of the recorded instructional videos (Chen Hsieh et al., 2017; Santos & Serpa, 2020; Strayer, 2012; Tanaka-Ellis & Sekiguchi, 2019). Moreover, to prevent students from attending class unprepared, the teacher organized short quizzes at the start of each session. Additionally, these quizzes may have promoted students' learning autonomy and their responsibility for their own learning outside school (Robles & Acedo, 2019). Besides helping to build rapport with students, incorporating WhatsApp as an easy and convenient social media platform and informal communication mechanism also enabled students to engage with peers, communicate with their teacher when questions arose, and experience innovative forms of instruction (Ahmad et al., 2020; Noroozi et al., 2020). In other words, findings in this study support the integration of informal online platforms like social media with video recording tools as more formal educational resources in language learning and teaching classes.

Furthermore, the post-test results suggest that the flipped learning space may have also enhanced students' grammar improvement by boosting learning motivation, learner autonomy, and self-regulation, which are predominantly supported by the communicative language teaching approach (Bishop & Verleger, 2013; Al-Harbi & Alshumaimeri, 2016; Hung, 2015; Noroozi, 2022) and formative assessment strategies (Black & William, 2018). Communicative language teaching considers interaction and communication key objectives of

language learning (Huang et al., 2017; Thornbury, 2016). The interaction element was initiated and mediated by creating and sharing videos that inverted classroom instruction to facilitate collaborative activities (Chen Hsieh et al., 2017; Pawlak, 2021; Turan & Akdag-Cimen, 2019), whereas the communication component was incorporated into the design through the use of social media and encouraging students to participate in games and discussions. At the same time, students benefited from multiple channels of feedback that informed them of the likely gaps in their knowledge of grammar and motivated them to self-regulate their own learning. In other words, the information they gathered from varied sources not only had the potential to promote their learner autonomy (Black & Wiliam, 2018) but also informed the teacher in designing new activities to bridge gaps in students' knowledge of grammar. This enhanced students' deeper engagement with instructional materials and raised their awareness of the importance of language learning as a process mediated by communication, interaction, and feedback.

Last but not least, the flipped approach holds strong potential for promoting task variety in teaching grammar among young learners who tend to appreciate and embrace working with peers, sharing, discussing, and playing games, rather than spending a considerable amount of time listening to lectures in more traditional language learning classes. In this study, stimulating real-world communication and creative activities such as guessing games, board games, and jigsaw puzzles helped students remain actively engaged at the center of instruction. To further diversify student learning, valuable class time was made available for other interactive and collaborative activities, including Venn diagrams, pair work dictations, and debates (Martin, 2012; Van Alten et al., 2019). This diversity, however, was not limited to instance of student engagement. With input shared through videos before class, the class teacher also had sufficient time to give instructions, provide likely necessary explanations, and offer feedback. In other words, teacher presence in this flipped space likely facilitated the acquisition of linguistic accuracy through authentic, communicative activities that emphasized fluency and agency in language use, allowing students with varied learning styles to practice grammar through meaningful communicative tasks.

Conclusion

This study provided evidence that flipped instruction can work as a useful delivery platform to facilitate the integration of learning enhancements in language learning classes. The findings offer pedagogical implications for both educators and policymakers. To begin with, teachers should reconsider the practicality of traditional teaching practices by advocating flipped instruction as a delivery platform and a technologically mediated learning space that has the potential to promote active learning strategies such as differentiation, peer collaboration, scaffolding, and problem-based learning (Ishikawa et al., 2019; Li, 2016; Melendez & Iza, 2017). In contrast to traditional language learning classes, the flipped classroom offers more opportunities for collaborative and

interactive learning, where the flipped teacher plays the role of a facilitator, guiding students' interaction and participation in learning activities (Huang et al., 2017; Thornbury, 2016). However, teachers should recognize the limitations of the flipped design as a delivery platform to teach all grammatical items, especially more advanced structures, which generally entail putting more effort into building strong connections between in-class and out-of-class learning activities, directly supporting and scaffolding students, and adopting the most appropriate technological tools (Jaramillo, 2019).

In addition, educators and teacher trainers in this and similar EFL contexts would benefit from these insights to provide teachers and students with essential training and access to resources. One practical approach might be to ensure that technology-mediated support is available at schools. This is particularly important as both students and teachers tend to use emerging technological tools in their day-to-day personal, academic, and social lives. Additionally, pre-service and in-service teacher training courses should develop teachers' ability to design flipped classes that effectively align in-person and out-of-class learning activities. In other words, engaging and stimulating interactive learning activities should be developed to provide students with active and cooperative learning opportunities, ensuring content coherence and proper scaffolding (Lai, 2023; Mehring & Leis, 2018; Turan & Akdag-Cimen, 2019; Webb & Doman, 2016). Such tasks should also motivate students to watch videos, digest their content (Broman & Johnels, 2019), and prepare for the follow-up face-to-face part of the lesson (Burke & Fedorek, 2017). However, students should not be overwhelmed with excessive out-of-class online materials, and video clips should be kept short to prevent student inattention or burnout.

This study presented flipped instruction as a delivery platform that allowed for the integration of multiple learning enhancements. These included video content, readiness quizzes, collaborative activities, teacher scaffolding, and digital communication support. We grouped these enhancements under the term flipped instruction without unpacking their individual contributions. In other words, the success of the flipped instruction depends on how this space is designed and what type of learning enhancements are incorporated to facilitate student language learning. Furthermore, this study focused specifically on testing students' performance on several grammatical structures over eight weeks, with no explicit tracking of student time on task nor student completion of homework. Similar research can benefit from investigating students' grammar learning over a longer period by extending the scope and length of the current study, the introduction of a second flipped group that does not view pre-class videos for example, the digital monitoring of student time on task, as well as employing qualitative means of data collection and analysis, to better track changes in student learning in a flipped classroom model. Future research in Kazakhstan could also involve similar studies in schools that use the Kazakh language as the medium of instruction. Muratkyzy (2020) suggested that high school students who use the Russian medium of instruction in the country outperform their Kazakh-speaking counterparts in international standardized reading tests. Therefore, it would be possible to explore whether flipped-style

interventions are also relevant to local language speakers who speak Kazakh. This and other extended research could help offer insights into the opportunities and challenges flipping instruction may pose in secondary schools in EFL contexts, where students need to have sufficient exposure to meaningful communicative learning activities to improve their grammar competency.

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Appendix A

Sample items from grammar pre-test

Part 1. First and Second Conditional, with subjunctives

Choose the correct form to complete the first or the second conditional sentences

1. If you don't leave now, you the train
a) miss b) will miss c) missed d) misses
2. If it tomorrow, we ... to the cinema.
a) rains/go b) rains/won't go c) will rain/will go d) rains/will go
3. If the class ... full, we ... another one.
a) is/will find b) will be full/find c) is/won't find d) will be full/will find
4. What ... we ... if the taxi?
a) will do/come b) will do/will come c) do/won't come d) will do/doesn't come
5. We won't find peace until we ... who did this.
a) find b) will find c) should find d) finds
6. A lot of health problems could be prevented if people ... better.
a) eat b) ate c) would eat d) eaten
7. You wouldn't have so many accidents, if you ... more carefully.
a) would drive b) will drive c) drove d) drive
8. If you were more responsible, maybe your parents ... you to do more things.
a) allowed b) would allow c) allow d) should allow
9. I am sorry, I can't go out. I'd go out if I ... this terrible headache.
a) didn't have b) don't have c) would not have d) will not have
10. If he ... a nice person, he ... people so badly.
a) is/won't treat b) were/would treat c) was/will treat d) were/wouldn't treat
11. If we ... late for the class, our teacher will be angry with us.
a) is b) were c) will be d) are
12. If I ... some fish, will you cook it for me?
a) will catch b) catch c) caught d) am catching
13. Unless you ... me alone, I'll call the police.
a) leave b) will leave c) won't leave d) don't leave

Part 2. Past Simple and Past Continuous Tenses

Which is correct?

14. Jane had a book open in front of her, but she ...it.
a) didn't read b) wasn't reading c) read d) were reading
15. I wasn't very busy. I ... much to do.
a) didn't have b) wasn't having c) had d) have
16. "What ... when you ... the accident?"
a) did you do/were seeing b) did you do/was seeing c) were you doing/saw
d) did you do/was seeing
17. I ... my finger while I
a) was cutting/cooked b) cut/was cooking c) cut/cooked
d) was cutting/was cooking
18. "How did you break your leg?" "I ... the tree, while I"
a) hit/was skiing b) was hitting/was skiing c) hit/skied d) was hitting/skied
19. I ... along the street when suddenly I ... footsteps behind me. Somebody ...
me.
a) was walking/heard/followed b) walked/heard/followed
c) was walking/heard/was following d) walked/was hearing/followed
20. When I was young, I ... to be a pilot.
a) wanted b) was wanting c) did want d) were wanting



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