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An Investigation into Flipped Learning Classroom (FLC) of EFL Sixth Grade Students' Grammar Literacy Development: Implications for Student-Centered Approach

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ABSTRACT

The educational landscape has undergone tremendous change due to the rapid development of technology, with virtual learning emerging as a prominent teaching method. In this regard, the Flipped Learning Class (FLC) model has recently been adopted as a cutting-edge approach. In this model, traditional classroom activities are logically reversed compared to tasks in conventional classrooms, often integrating teaching materials in the form of videos or PowerPoint presentations. The objective of this study is to clarify the impacts of FLC instruction on sixth-grade students' grammar literacy, comparing it to traditional face-to-face teaching through two distinct methodologies. Quantitative research approach was employed for this study. From a pool of 120 male sixth-grade elementary students aged 12-13, 100 were selected based on their scores in the Quick Oxford Placement Test. These students were divided into control and experimental groups. The control group experienced traditional face-to-face teaching without a social platform, completing homework at home. Conversely, the experimental group underwent FLC instruction using the Shad application as a social platform. A two-month teaching program was designed to cover the main English Grammar teaching objectives. As the primary instruments of the study, an English grammar test was used as both pretest and posttest for data collection. The pre-test was administered to both groups at the beginning of the study. After 16 sessions of teaching grammar to sixth-grade students, the post-test was given to assess any differences between the two groups due to the treatment. Independent-Samples t-tests were used to compare the means of the independent groups (experimental vs. control) for the post-test. The results indicated that the experimental group performed significantly better than the control group. Additionally, the findings suggest several pedagogical considerations for educators, learners, curriculum developers, and administrators. Educators, policymakers, and institutions can leverage these findings to optimize instructional approaches and enhance students' self-efficacy, academic literacy, and positive perceptions of the flipped learning experience in virtual learning contexts. Further study is recommended to explore the prolonged impacts of FLC model and assess its adaptability in various educational settings.

Key words: Flipped Learning Classroom, Grammar Literacy, Traditional Model Of Teaching, Student-Centered

INTRODUCTION

Background to the Study

In the late 20th and early 21st centuries, the advent of technology, particularly information and communication technology (ICT), has profoundly influenced all aspects of individual and societal life. With the collapse of temporal and spatial boundaries, the earth has transformed into a global village (Lee & Lee, 2010). Information and communication technology (ICT) has exerted a considerable influence and is currently reshaping various domains, with education being a notable example. This includes a significant impact on traditional educational practices.

The rapid technological development of the world has largely emphasized that conventional traditional educational methods are no longer sufficient to meet students' needs. Efforts have been made to promote students as creators and producers of knowledge, and to open new doors in the fields of science and technology, by providing innovative methods tailored to students' personal and social requirements. Additionally, recent decades have seen the emergence of new methods that shift knowledge transfer from a behavioral to a constructivist perspective.

Currently, English language instruction stands as a highly significant and widely employed domain in the educational sphere. Globally, the prioritization of English teaching is

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evident. Despite its prominence, English teaching largely remains anchored in traditional curricular frameworks, with instructional methodologies often not aligning with the diverse and evolving requirements of learners. However, innovative educators have crafted pedagogical approaches aimed at enhancing learner self-efficacy, motivation, and the overall quality of language acquisition (Johnson, Becker, Estrada & Freeman, 2014; Rahimi & Fathi, 2021).

We might recall experiences of sitting inactively in classrooms, feeling frustrated as we listened to teachers who conducted lessons without engaging us. In such teacher-led scenarios, students were expected to be nothing more than passive listeners, confined to their desks. Historically prevalent, the teacher-centered approach positioned the teacher as the sole orator: posing questions, receiving answers, and writing on the blackboard while students passively took notes. This approach placed the teacher in a pivotal and central position within the classroom dynamic (Hadadi & Sadri, 2020).

Experts, including Rahimi and Fathi (2021), emphasize the importance of employing cutting-edge, student-centered techniques in constructivism. Currently, the teaching of English is one of the most significant and widely utilized fields in education worldwide, with English instruction being a high priority. However, despite its importance, teaching English often remains a traditional component of school curricula, with methods not fully adapted to the varying needs of diverse learners. To address this, creative educators have developed innovative pedagogical strategies aimed at enhancing self-efficacy, motivation, and the overall quality of language learning (Johnson, Becker, Estrada & Freeman, 2014; Rahimi & Fathi, 2021).

Educational technology experts, as noted by Maghsodi (2021), assert that while many current teacher preparation programs align with traditional goals and are suitable for a pre-computer era, they fall short in addressing the needs of the 21st century. However, the rapid advancement of technology in education led to the emergence of a novel instructional method, commonly referred to as blended learning. As described by Bonk & Graham (2012), this innovative method merges conventional education with online practice to foster a collaborative, learner-centered environment. A key aspect of blended learning is flipped instruction, which, by rearranging the learning mechanism, allows students more study time before, during, and after class, enhancing their learning experience (Bergmann & Sams, 2012; Kushairi & Ahmi, 2021; Fathi et al., 2021).

Lage et al. (2000) initially introduced FLC model in education. However, it was Bergman and Sams who significantly expanded on this innovative strategy. In 2012, they published the book "Flip Your Class," thereby coining the term "*Flipped Class*." As American chemistry teachers, the authors detailed in their book various student challenges encountered during lessons, such as tardiness, superficial conceptual understanding, poor learning strategies, low motivation, and a lack of interest in certain subjects. To address these issues and cater to individual student needs, they advocated for personalizing the teaching-learning process through presentations and the flipped class model. The term "inverting" or "inverting the class" refers to the practice of reversing the traditional classroom dynamics – what is typically done in the classroom is moved to the home, and what is usually homework is done in the classroom (Fathi & Rahimi, 2020).

FLC model is one of the more ambitious educational concepts that emerged in the last decade of the 20th century with the intention of promoting inclusive learning, being responsive to student needs and using very simple technology (Fathi & Rahimi, 2020). As a cutting-edge pedagogical strategy, Flipped Learning Classroom (FLC) reverses instruction and homework. In conventional teaching, students listen to their teachers' lectures in the classroom and complete their assigned assignments at home.

Based on several research studies (Davies, Dean, & Ball, 2013; Ferreri & O'Connor, 2013; Polat & Karabatak, 2021; Strayer, 2012), the incorporation of increased interaction, learner autonomy, active participation opportunities, adaptability in material review, extended practice duration, and the promotion of collaborative activities and teamwork contribute to an effective learning approach. This instructional method proves to be a valuable means of optimizing classroom time.

Numerous educators have acknowledged the favorable impacts of the FLC model (Bergmann & Sams, 2012; Strayer, 2012; Zhu, 2021). However, more empirical research is required to confirm whether this kind of teaching can improve students' language learning. Flipped instruction seems acceptable for second language teaching as it is consistent with recent developments in language acquisition theories. By providing a communicative and learner-centric environment, Mehring (2016) promotes the enduring importance of flipped instruction in the context of L2 learning and provides a set of tools for flipped instruction in L2 settings. Peer review, collaborative learning, higher levels of engagement, and fruitful dialogues are facilitated by flipping the classroom, allowing students to internalize their own information and take ownership of their learning (Butt, 2014; Hawks, 2014; Lee, 2021; Talbert, 2012).

Objective of the Research and Research Question

This research aimed to examine the effect of FLC model on sixth graders' grammar literacy. The study also sought to analyze whether there is a significant difference between the implementation of the FLC model and traditional classroom methods in improving the grammar literacy of Iranian EFL sixth graders. To achieve this, the research focused on the following question:

RQ (1): *Is there any significant difference in terms of English Grammar literacys of Iranian sixth grade students when comparing those who were taught through flipped learning method (experimental group) and those taught through traditional method (control group)?*

LITERATURE REVIEW

Definitions of Flipped Learning Classroom (FLC)

Although the terms "*flipped classroom*" and "*flip teaching*" have recently gained prominence in education, the

underlying teaching strategy is not a new concept (Berrett, 2012; Davies, Dean, & Ball, 2013). Over the past decade, the literature has introduced several terminologies to describe this model. This approach inverts the conventional structure of in-class lectures and outside homework. Some of these terms include inverted classroom, just-in-time teaching, flipped classroom, and inverted learning (Fulton, 2012; Hung, 2017).

Several terms exist for the FLC model, including the *inverted classroom*, blended learning, and simply "flip" (Bergmann & Sams, 2013). In this model, the traditional approach of using class time for direct instruction and assigning content-related homework is reversed, or "flipped." This allows students to access instructional materials at home, freeing up class time for various educational activities. Milman (2012) emphasized this point:

> The concept revolves around the notion of optimizing valuable classroom time. Instead of utilizing this time for traditional concept introduction by the instructor, typically through lectures, the approach suggests that instructors can develop alternative teaching tools such as video lectures, screencasts, or vodcasts. This method effectively imparts the necessary concepts to students outside the conventional class setting. Consequently, this frees up classroom time, allowing it to be dedicated to more interactive and often collaborative activities, which are usually conducted under the guidance of the instructor (p. 85).

The FLC approach has risen in prominence, primarily attributed to technological progress and the expanded availability of computers and various mobile devices, as highlighted by Davies and colleagues in 2013. However, the FLC model lacks a single, widely accepted description, as each instructor adopts a unique method of instruction. The phrase "homework is done in class and classwork is done at home" is a popular explanation of the flipped approach, but Kostka and Lockwood (2015, p. 2) argue that this phrase does not fully capture its essence. Bergmann and Sams (2014) suggest that moving direct instruction outside of the classroom is "a great place to begin your journey, but it is not the destination itself."

Abeysekera and Dawson (2015) characterized FLC model as:

> a composite of educational strategies, encompassing three core elements: Firstly, it involves the transfer of most of the direct information delivery outside of the classroom setting. Secondly, it prioritizes the utilization of class time for engaging in activities that are both interactive and collaborative. Lastly, it necessitates the completion of designated tasks by students, either prior to or following the class, to maximize the efficacy of the in-class activities (p. 3).

Abeysekera & Dawson (2015) claimed that their definition of FLC is a superset of all other definitions. This is because it avoids making claims about the model's benefits, criticizing conventional teaching methods, assuming motivations of implementers, or specifying the technologies to be used (as cited in Larsari, Dhuli, et al., 2023).

Bergmann and Sams (2012) defined FLC model as follows: "What is traditionally done in class is now done at home, and what is traditionally done as homework is now completed in class" (p.13). The Flipped Learning Network (2014) provided a detailed definition of the FLC, which is:

> Flipped learning represents a teaching methodology where traditional direct instruction shifts from a collective learning environment to an individualized one. This adjustment transforms the group learning space into an active and interactive setting. Within this space, the educator plays a pivotal role in facilitating and guiding students as they actively apply concepts and engage in creative exploration of the subject matter (p. 1).

Theoretical Underpinnings of Flipped Learning Classroom (FLC)

Theoretical foundations underpin the development of FLC model, guiding its evolution. Three key theoretical foundations – *constructivism*, *social learning theory*, and *experiential learning theory* – support the FLC. These theories offer a framework for understanding student learning, aiding educators in crafting effective learning environments. Given their extensive application in various teaching models and their significant relevance in education, we have chosen to delve deeper into these theories. Their applicability is particularly evident in the planning and implementation of FLC model.

Constructivism

As the dominant educational ideology, constructivism significantly influences the contemporary learning-teaching process. The ideas of Piaget and Vygotsky greatly inform constructivist learning strategies and teaching techniques (Tzuo, 2007). Unlike conventional learning theories which primarily focus on learning from an individual standpoint, constructivist theories posit that learning is an active process of constructing meaning and knowledge through social interactions. Constructivists assert that learning, and consequently the representation of reality, emerges from the mental creation of abstract ideas (Bruner, 1961). The flipped model of instruction exemplifies constructivism's principle that students should actively participate in their own education. According to constructivism, students actively construct knowledge and meaning through their experiences and interactions with the world. This concept suggests that students learn most effectively when they are actively engaged in the learning process and have opportunities to apply their knowledge in real-world situations, which carries significant implications for educational practice (Larsari, Farrokhi, et al., 2023) The foundations of active, peer, and collaborative learning, based on constructivism, have been highlighted in several studies assessing research on flipped classrooms (Eppard & Rochdi, 2017; Zuber, 2016). The core ideas of constructivism are manifested through the strategies of the flipped classroom. In this model, learning is active, and information is provided to assist students in

problem-solving. In flipped classrooms, students are required to construct their own knowledge, facilitating learning and collaboration (Bishop & Verleger, 2013). The constructivist philosophy underpins the educational strategy known as the "Flipped Learning Classroom" (FLC). FLC engages students in active learning through group projects, hands-on activities, and in-class discussions. By offering access to pre-recorded lectures or instructional videos outside of class time, FLC allows students to take greater control of their learning, focusing on applying their knowledge in meaningful ways during class sessions. Research indicates that the use of FLC model can significantly promote student involvement, critical thinking, and problem-solving skills (Bishop & Verleger, 2013; Lage, Platt & Treglia, 2000). For instance, a study by Strayer (2012) revealed that students in a flipped statistics course demonstrated better conceptual knowledge and higher levels of engagement compared to those in a traditional lecture-based course (Larsari, Wildová, et al., 2023).

Bandura's social learning theory

Another theoretical foundation for FLC model is provided by Bandura's social learning theory, which explains how learning occurs and is sustained. Bandura (1977) posited that a student's behavior, environmental context, and past experiences all influence subsequent actions. This theory argues that learning is a social process, where students acquire knowledge through interactions with peers and adults. As Abbott (2007) notes,

> social learning theory highlights the interplay between environmental and cognitive factors in human learning and behavior, emphasizing social context-based learning. It acknowledges that people can learn from one another through methods such as imitation, modeling, and observational learning (p. 25).

Bandura (1997) further explained that students acquire new knowledge and behaviors by observing classmates. His theory categorized various types of learners as observational learners or modelers, emphasizing the cognitive, contextual, and behavioral influences on human behavior. In flipped classrooms, social learning theory is consistently evidenced. Students are exposed to media where a presenter models appropriate behavior. Effective learning occurs through attention, retention, reproduction, and motivation, especially when students focus on the teacher's instructions (Alvarez, 2012; Fulton, 2012; Miller, 2011). The flipped classroom aligns with Bandura's Social Learning Theory, offering effective modeling of concepts through web videos, teacher-produced films, or other media. Engaged students then retain, replicate, and apply the learned concepts in practice problems and real-life situations. Although FLC may not address every challenge in conventional learning environments, it begins to tackle some, particularly in enhancing student engagement, providing prompt feedback, and fostering collaboration. These aspects can help students retain concepts longer and apply them practically (Alvarez, 2012; Bergmann & Sams, 2012b; Berrett, 2012).

Experiential learning theory

In the 1970s, Kolb developed the renowned Experiential Learning Theory (ELT), positing that learning occurs through the assimilation of new experiences with preexisting concepts. ELT aligns with constructivist principles, asserting that "social knowledge is created and recreated in the personal knowledge of the learner" (Kolb & Kolb, 2005, p. 194). According to Kolb's theory, learning transpires through a cycle of experiencing, reflecting, thinking, and acting. This cycle comprises four stages—concrete experience, reflective observation, abstract conceptualization, and active experimentation, collectively known as Kolb's Learning Cycle. ELT suggests that learners can gain skills and knowledge not only from personal experiences but also through reflecting on those experiences. Recently, FLC model, often simply called the flipped classroom, has gained prominence as a teaching method. This model upends the traditional classroom paradigm by reversing the order of learning activities. In FLC model, students first encounter new concepts and materials through online readings, podcasts, and videos before engaging in physical classroom sessions. The model aims to encourage active student participation in education by allowing them the flexibility to learn at their own pace and on their own schedule. FLC model has been identified as an effective way to implement ELT. According to ELT's experiential learning cycle, the Flipped Classroom Model's use of online resources enables students to explore and reflect on content at their convenience. Furthermore, by facilitating active experimentation in the classroom, the flipped classroom model can help students develop critical thinking and problem-solving skills (Salimi & Larsari, 2015).

How can Grammar Literacy Development Improve in Flipped Learning?

Grammar literacy development can improve in a flipped learning environment through several key aspects:

Pre-class engagement

Students encounter grammar concepts through videos or reading materials before class, allowing them to familiarize themselves with the basics at their own pace. This pre-class engagement ensures that students come to class prepared, making in-class activities more effective (Abeysekera & Dawson, 2015).

Active learning

In the classroom, students actively apply grammar rules in various activities, discussions, and problem-solving exercises. This hands-on approach reinforces their understanding and helps in internalizing grammatical structures (Bergmann & Sams, 2012b).

Personalized feedback

Teachers can provide more personalized and immediate feedback during class, addressing individual student needs and misconceptions. This targeted feedback is crucial for understanding complex grammar rules and correcting errors.

Collaborative learning

Flipped classrooms often involve group work and peer learning, where students can learn from each other. Discussing and teaching grammar rules among peers can enhance understanding and retention (Bergmann & Sams, 2012b).

Increased motivation and engagement

By engaging with grammar in a dynamic and interactive environment, students are likely to be more motivated and involved in their learning, which can lead to better outcomes in grammar literacy.

METHOD

Research Design

The main objective of this research is to examine the effect of FLC model on sixth grade students' English grammar literacy development. In this regard, this research employed a quasi-experimental design comprising two classes that began their English Grammar class in a private English Language institute in Iran. Two intact classes were divided into experimental and control groups in this design. English grammatical literacy is dependent factors in this study, whereas the teaching models (*flipped classroom* and *face-to-face*) are independent variables. The English grammar literacy test was administered to the experimental and control groups as pre-tests prior to the experimental process and as posttest after the intervention. The experimental group (i.e., the flipped classroom), videos, and materials were presented before the class time, while the control group (i.e., the non-flipped classroom), videos, and materials were not presented before the class time. This was done in accordance with the flipped classroom model to free up the class time for student cooperation and collaboration. Both the experimental and control groups had a post-test that included the English grammar literacy test.

Participants

Participants were selected from the population of EFL sixth grade students who were learning English as a foreign language (EFL) in three English Language institutions in Iran during the winter semester of 2022. Sixth grade students were only male, their age level was ranged from twelve to thirteen years old. 100 elementary level of sixth grade students were chosen from 120 sixth grade students of Iran who were learning English as a foreign language (EFL) in three English Language institutions in Iran based on their scores on the Oxford Quick Placement Test (OQPT) and all students had participated in the Oxford placement test prior to the onset of the course, and their scores ranged from a total band score of 0 to 20 which is correspondent to the A1 elementary level according to the interpreting scores of Oxford placement test. All the sample population in this research were sixth grade male students who were in the same socio-economic status, geographical area, and socio-cultural level in the Rezvanshahr city of Guilan province in the winter semester of the 2022-2023 academic year. After homogenizing, some of the population was dropped out from the study. The researchers then divided the participants into two intact groups, an experimental group, and a control group, each consisting of 50 six graders. The type of sampling was convience sampling in this research.

Materials and Instrumentations

Oxford placement test (OPT)

In this study, the researchers utilized the Oxford Placement Test to evaluate the general language abilities of students at the outset. This assessment was crucial to confirm the uniformity of the participants' skills. The test's scoring system divides candidates into four categories based on their English proficiency: elementary (scores ranging from 0 to 20), pre-intermediate (21-30), intermediate (31-44), and upper intermediate (45-50). This well-established test is recognized for its validity, and its reliability has been substantiated in several studies, such as those by Geranpayeh (2003) and Jones (2000). In this specific research, the test's reliability was confirmed through the Kuder-Richardson 21 formula, yielding a high score of 0.85. The study focused on volunteers who fell into the elementary level category. Thus, only those who scored within the 0 to 20 range were chosen for inclusion. Out of 120 students assessed, 100 were ultimately selected for the study. These participants were then evenly distributed into two groups: one experienced the flipped classroom model as the experimental group, while the other received traditional classroom instruction, serving as the control group.

As Table 1 shows scores for Oxford Placement Test (OQPT). The test's scoring system divides candidates into four categories based on their English proficiency: elementary (scores ranging from 0 to 20), pre-intermediate (21-30), intermediate (31-44), and upper intermediate (45-50). Students had participated in the OQPT prior to the onset of the course, and their scores ranged from a total band score of 0 to 20 which is correspondent to the A1 elementary level based on interpreting scores of OQPT.

Book grammar friends 1

The study utilized "*Grammar Friends 1*," a textbook authored by Tim Ward and published by Oxford University Press in 2013. This textbook contains 15 lessons specifically designed for sixth-grade primary students, focusing on grammar instruction. For this study, the instructor covered 7 of these lessons over 16 sessions, conducted twice weekly within the allocated timeframe.

Table 1. Interpreting scores for oxford placement test (OQPT)

Test	Total	Elementary	Pre-Intermediate	Intermediate
Grammar & Vocabulary	50	*0-20	31-44	>31

Grammar test

This test was developed by Reza Kheir Abadi in 2016. This test consists of 25 multiple-choice questions, derived from Macmillan Publisher's standardized tests for beginner and elementary levels (Ker & Jones, 2007), and modified to suit the linguistic capabilities of sixth-grade primary school students. In some cases, specific words and nouns were localized or contextualized with terms familiar to Iranian primary students to enhance the test's relevance and comprehensibility.

Pre-test of grammar

This 25-item grammar test, meticulously designed and piloted by Reza Kheir Abadi in 2016, is tailored for the experimental study. It includes grammatical rules within sentences and expressions. The pre-test was conducted at the onset of the study to evaluate the participants' proficiency in, and acquaintance with, the specific grammatical structures being targeted. The format of the test is multiple-choice, with 25 distinct items.

Post-test of grammar

This test is a parallel form of the 25-item pretest, with changed sequencing and organization of items to mitigate the effects of learning and memorization. It was used to assess participants' short-term memory regarding the instructed syntactical rules at the end of the treatment sessions.

Power points and work sheets

PowerPoints and worksheets related to the lessons were provided, revised, and sent to the treatment group. Students were tasked with creating PowerPoints for sentences or phrases from their book as homework and sharing them with their peers in the group. They were also allowed to add their own voice to the PowerPoints.

Shad platform application

The Shad platform application was used as a social platform for distributing study materials, receiving students' projects, providing online feedback, supervising peer scaffolding and academic literacy, and informing students about upcoming class programs.

Data Collection Procedures

In this research, the participants were chosen from a cohort of sixth-grade students engaged in learning English as a Foreign Language (EFL) at English-speaking schools. From a group of 120 sixth-grade Iranian students at three English-speaking schools in Rezvanshahr, Iran, a total of 100 students were selected. This selection was based on their performance in the Oxford Quick Placement Test (OQPT), where their scores ranged from 0 to 20, indicative of an elementary level of proficiency. It's important to note that the entire sample population comprised male sixth-grade students who were in Rezvanshahr City, Guilan Province, during the winter semester of 2022. They shared the same socioeconomic status, geographic region, and educational background at a similar sociocultural level. After homogenization, a portion of the population was excluded from the study. The remaining participants were randomly divided into two intact groups, experimental and control, each consisting of 50 students. Prior to the experimental process, an English Grammar literacy test was administered as a pretest to both groups. During the experimental phase, the experimental group received videos and electronic materials via the Shad platform application as a social platform, following the flipped classroom model. They were expected to watch these video lectures at home before attending classes under FLC model. The video lectures, created by the researchers and the participating teacher, covered key grammar points from the Grammar Friends 1 elementary school level. In class, students engaged in activities based on their prior learning at home, including discussions, workbook exercises, collaborative problem-solving, and practice of the learned materials. In contrast, the control group (non-flipped classroom) was presented with videos and electronic materials during class time, following a traditional teaching approach where the teacher delivered material in class, and students completed homework and assignments outside of class. The content and scope of the lessons were identical for both groups, differing only in the teaching method. At the end of the experimental process, a post-test of the English Grammar test was administered to both the experimental and control groups to assess the intervention's impact.

Data Analysis

Independent sample t-test was used to answer the research question.

RESULTS

The results reported in the study address the research question under inestigation. The obtained results are, therefore, interpreted and discussed in relation to the objectives sought by thes tudy.

RQ: *Is there any significant difference in terms of English Grammar literacy of Iranian sixth grade students through flipped learning method (experimental group) and those taught through conventiona method (control group)*?

The research question aimed to explore the impact of the flipped learning approach on the grammatical literacy of Iranian sixth-grade students at the elementary level. For a comprehensive overview of the gathered data, descriptive statistical analyses were conducted. This involved calculating the mean and standard deviation for both the pretest and posttest scores in grammar, within the control and experimental groups.

Descriptive statistics of grammar pre- and posttest in two groups

As Table 2 (below) shows, the mean scores on the grammar pre-test in the control and experimental groups were close, indicating that they scored very similarly on the grammar pre-test. The mean of the posttest in the control group (M=15.98) and in the experimental group (M=17.20) shows that the

flipped classroom group achieved a higher average grammar score and a better grade. Furthermore, the experimental group showed a significant increase from pre-test (M=15.98) to post-test (M=17.20), suggesting better grammar literacy. This finding suggests that the implementation of the flipped classroom model had a positive impact on the grammar literacy of the experimental group. The significant increase from pre-test (M = 15.98) to post-test (M = 17.20) in the experimental group further supports the effectiveness of the flipped classroom approach in enhancing grammar literacy. The observed improvement indicates that the flipped learning model positively influenced students' learning outcomes, resulting in better grammar proficiency compared to traditional instruction.

Grammar pretest and posttest results for control group (non-flipped learning classroom)

Table 3 displays the descriptive statistics for the control group's grammar pre-test and post-test. The outcomes for the control group in both assessments suggest an enhancement in learning efficacy. Nonetheless, further analysis is required to ascertain whether this enhancement is substantial enough to justify the rejection of the null hypothesis.

For the application of the paired-samples t-test, it is essential to establish a notable correlation between the pretest and posttest scores, signifying a linkage between data collected from these two assessments. According to Table 4, there is no statistically significant correlation between the pretest and posttest scores ($p < .05$). This result implies that the pretest scores do not strongly predict or influence the posttest scores. Therefore, any changes observed in the posttest are not directly linked to the participants' initial performance on the pretest.

The results of the one-sample test showed that there is not any significant difference between the means of the control group from the pre-test to the post-test, and it can be assumed that although the learners in this group have improved in their grammar literacy, the observed difference is not significant enough.

Table 2. Descriptive statistics of grammar pre- and posttest in two groups

Tests	Groups	Mean	Std. deviation
Pretest	Control	15.6200	2.96159
	Experimental	16.0400	2.87821
Posttest	Control	15.9800	2.79570
	Experimental	17.2000	2.06032

Table 3. Descriptive statistics in control group (grammar pretest and posttest)

	Mean	N	Std. deviation	Std. error mean
Pair 1				
Prettes.Con	15.6200	50	2.96159	0.41883
Posttest.con	15.9800	50	2.79570	0.39537

Table 4. Paired samples correlations

	N	Correlation	Sig.
Pair 1			
Prettes.Con & Posttest.con	50	0.169	0.240

Grammar pretest and posttest results for experimental group (flipped learning classroom)

To determine whether there are any improvements or not, the researchers performed the same statistical analysis for the experimental group. The results of the corresponding analysis are shown in Tables 5 to 7.

The mean score for the experimental group in the pretest was 16.04, while it increased to 17.20 in the posttest (Table 6). This rise in mean scores from the grammar pretest to the posttest, from 16.04 to 17.20, indicates an enhancement in the learners' performance. Yet, it remains to be established if this improvement is statistically significant enough to warrant a rejection of the null hypothesis. Consequently, a paired-samples t-test was performed to examine the differences between the pretest and posttest mean scores of the experimental group.

One of the foundational assumptions of the paired samples t-test is the necessity for a substantial correlation between pretest and posttest scores, which signifies a linkage in the data derived from these two assessments. As evidenced in Table 7, the correlation between the pretest and posttest scores is statistically significant ($p < .05$).

Table 8 indicates that the significance value is below 0.05. Consequently, we can infer that the mean difference is significant, and that the learners' performance improved from the pretest to the posttest. In other words, the null hypothesis related to this research question is rejected. This implies that flipped instruction significantly improves the grammar performance of elementary sixth graders.

Grammar posttest results for experimental and control group (flipped learning classroom vs non-flipped learning classroom)

The comparison of grammar posttest results between the experimental and control groups provides valuable insights

AQ1 **Table 5.** One sample t-test (grammar pretest and posttest)

	Paired differences					t	df	Sig. (2-tailed)
	Mean	Std. deviation	Std. error mean	95% confidence interval of the difference				
				Lower	Upper			
Pair 1								
Prettes.Con - Posttest.con	-0.36000	3.71297	0.52509	-1.41521	0.69521	-0.686	49	0.496

into the effectiveness of the flipped learning approach in enhancing English grammar literacy. These findings contribute to our understanding of innovative instructional practices and their potential impact on language education, particularly for Iranian sixth-grade students.

The mean score for the experimental group is 17.20, while the mean score for the control group is 15.98 (Table 9). The experimental group exhibits a slightly higher mean score compared to the control group. However, it is necessary to statistically compare the two means to determine the significance of this difference.

An independent-samples t-test was conducted to compare the grammar post-test scores of the two groups (Table 10). The significance level of Levene's test was.00, indicating that the variances of the two groups were not equal. Based on the results obtained ($t_{90.10}$= 2.484, p <.05), it can be concluded that the use of flipped learning had a statistically significant effect on the students' grammar performance, leading to the rejection of the null hypothesis of the study.

DISCUSSION

The first research question of this study examined whether there were differences in the English grammar literacy of Iranian sixth graders who are learning Enlish as Foreing language (EFL) in English language institutions when comparing students taught using FLC (experimental group) and those taught using traditional method (control group).

After collecting the data, the researchers used independent samples t-test to analyze them to find out the effectiveness of FLC on sixth grade students' grammar literacy. According to the results, the mean score of the experimental group is 17.20, while the mean score in the control group is 15.98. The experimental group (FLC Model) exhibits a slightly better mean score compared to the control group (TL approach). Then, an independent-samples t-test was performed to compare the means of the grammar posttests for the two groups. The significance level of the Leven's test is.00, which means that the variances of the two groups are not equal. Considering the results obtained ($t_{90.10}$= 2.484, p <.05), it can be claimed that the use of flipped learning had a statistically significant effect on the students' grammar performance, thus rejecting the null hypothesis of the study.

The findings showed that the students who received Grammar instruction through FLC (FLC) had better performance compared to those who were trained through traditional classroom. The results statistically revealed that experimental group significantly did better than the control group (p <.05). Therefore, the null hypothesis of the study "there is not any significant difference in terms of English Grammar literacy of the primary stage in Iranian sixth grade students when comparing students taught using FLC (experimental group) and those taught using traditional method (control group) was rejected. In fact, the experimental group gained higher scores on their post-test. This may be due to some appealing features the flipped classrooms have. The results of the independent samples t-test showed that there was a significant difference in post-test English grammar literacy between the performances of learners in the experimental and control groups. In other words, flipped learning had a positive effect on the grammar literacy of sixth grade students. Based on the results of the independent samples t-test, the FLC model has a significant impact on the English grammar literacy of students of sixth graders when students taught in the FLC (experimental group) use such are compared, which are taught in traditional teaching methods (control group).

The most striking finding that emerged from the data showed that students in the FLC made greater progress in English grammar literacy after the test than students in the control group. This confirms that the implementation of FLC model can contribute to the development of grammar literacy in sixth grade school students. The positive result of employing the flipped classroom in this study is in line with the finding of Kheirabadi (2015), indicated that the FLC had similar effects on English grammar literacy among tenth students in Iran. Kheirabadi (2015) conducted empirical research entitled "*The impact of the flipped learning classroom model on learning grammar in tenth grade*". He used a highly experienced English language teacher conducted a study on two groups of tenth-grade female students in the Fourth District of Tehran. The teacher taught the same English textbook unit using both traditional and FLC methods. The data was

Table 6. Descriptive statistics in experimental group (grammar pretest and posttest)

	Mean	N	Std. deviation	Std. error mean
Pair 1				
Prettest.EX	16.0400	50	2.87821	0.40704
Posttest.Ex	17.2000	50	2.06032	0.29137

Table 7. Paired samples correlations

	N	Correlation	Sig.
Pair 1			
Prettest.EX & Posttest.Ex	50	0.766	0.000

Table 8. One sample t-test (grammar pretest and posttest)

	Paired differences					t	df	Sig. (2-tailed)
	Mean	Std. deviation	Std. error mean	95% confidence interval of the difference				
				Lower	Upper			
Pair 1								
Prettest.EX - Posttest.Ex	-1.16000	1.85560	0.26242	-1.68736	-0.63264	-4.420	49	0.000

collected at three levels: A) Multiple-choice test results based on the taught content, B) Feedback from students through a researcher-designed questionnaire, and C) Expert opinion of the teacher through semi-structured interviews. The findings analyzed using SPSS statistical software, did not show a significant difference in performance between the experimental and control groups based on the test results. However, in the other two levels, satisfaction, increased motivation of students, and optimization of the teaching process in terms of time management and avoidance of repetitive and tiresome routines were observed. Justification and collaboration of influential groups in the teaching process, especially school administrators and parents, are important for the success of this educational strategy. This study's findings align with those of Al-harbi and Alshumaimeri (2016), who identified a positive influence of the FLC model on the development of Saudi secondary school students. Lee and Wallace (2018) similarly observed elevated mean scores among students in flipped classrooms. Consistent with these results, Krolu and Çakır (2017) discovered that flipped instruction notably enhanced students' grammatical competence and speaking abilities. Furthermore, the findings corroborate Obari and Lambacher's (2015) research, which demonstrated the beneficial effects of flipped learning on English language proficiency. Engin's (2014) findings, indicating improvements in language skills due to flipped learning, are also in agreement with this study. A plausible explanation for these outcomes is that students might engage more effectively with pre-lesson videos at their convenience, revisiting the content multiple times for clearer comprehension. This approach, as noted by Herreid and Schiller (2013), facilitates a more efficient use of classroom time, focusing on practical language application rather than extensive lecturing.

Table 9. Descriptive statistics grammar posttest in experimental and control groups

Group	N	Mean	Std. deviation	Std. error mean
Posttest				
Flipped Learning Classroom	50	17.2000	2.06032	0.29137
Non-flipped learning classroom	50	15.9800	2.79570	0.39537

CONCLUSION

The primary objective of this study was to investigate the impact of FLC approach on the grammar literacy of sixth-grade students within the Iranian primary education system. Additionally, the researchers aimed to assess whether a note-worthy distinction exists in enhancing the grammar literacy of Iranian sixth-grade students studying English as a Foreign Language (FL) when exposed to the FLC model compared to the traditional classroom method in English language institutions in Iran.

A key finding of this study underscores the efficacy of comparing FLC and traditional face-to-face instruction in fostering favorable student attitudes and improving learning outcomes, particularly in the context of advancing grades. The primary objective was to evaluate potential disparities in participants' grammar literacy and academic literacy advancements between the experimental and control groups. The study's outcomes revealed that students in the FLC demonstrated superior performance on the posttest compared to their counterparts in the control group. Moreover, the investigation highlighted that the FLC not only enhanced learners' grammar literacy but also positively influenced their perceptions of the instructional model.

This research offers valuable insights into the implications of implementing FLC model within a virtual primary school environment. The findings suggest that the adoption of flipped learning significantly enhances the grammar literacy of sixth-grade students in virtual settings. Students exhibited increased confidence in their ability to autonomously navigate their learning path, showcasing improved self-directed learning. Notably, examination scores witnessed improvement when compared to conventional lecture-based instruction. Furthermore, students displayed overwhelmingly positive perceptions of flipped learning, reporting heightened engagement, motivation, and overall satisfaction with the learning experience. The study's revelations underscore how the integration of technology into an innovative teaching approach effectively addresses learners' needs. Unfortunately, Iranian elementary school students encounter challenges in motivation and self-belief due to instructional methods and learning approaches. A thorough examination of the Iranian English as a Foreign Language (EFL) environment is imperative to facilitate improved

Table 10. Independent samples test: Posttest of by groups

	Levene's test for equality of variances		t-test for equality of means						
	F	Sig.	t	df	Sig. (2-tailed)	Mean difference	Std. error difference	95% confidence interval of the difference	
								Lower	Upper
Posttest									
Equal variances assumed	11.468	0.001	2.484	98	0.015	1.22000	0.49114	0.24535	2.19465
Equal variances not assumed			2.484	90.101	0.015	1.22000	0.49114	0.24428	2.19572

performance and well-being in primary school students. The study emphasizes the pivotal role of actively involving students in the learning process for achieving academic success.

This research yielded significant empirical support for the effectiveness of FLC as a reputable method for fostering education beyond traditional classroom settings. The strategy notably enhances students' interactive skills through the implementation of student-centered active learning approaches. Given the importance of integrating new technologies into pedagogy and practical applications, the FLC strategy emerges as a fitting approach for English as a Foreign Language (EFL) environments, particularly within primary school contexts. The experimental group students benefited from a unique approach to learning English grammar, offering a practical solution to the challenges associated with EFL education at the elementary level in Iran.

This study revealed that employing FLC approach in English language instruction yielded superior outcomes in grammar learning when compared to conventional teaching methods. The flipped model entails students acquiring content independently outside of regular class hours, typically through videos or other resources. This shift allows for a more effective utilization of class time, dedicating it to the practical application and reinforcement of grammar principles. Students in the experimental group, exposed to flipped learning, demonstrated a more proficient command of the textbook material in comparison to their peers in traditional lecture-based classrooms. The researchers concluded that the flipped approach affords additional opportunities for meaningful grammar practice, effectively addressing the constraints imposed by limited classroom time. Shifting content delivery outside of class enables students to learn at their own pace, while in-person class sessions become focused on providing personalized guidance and support. This study revealed that the implementation of the Flipped Classroom (FLC) model in English grammar classes had positive outcomes, with students finding it time-efficient and beneficial for learning new material. Interviews indicated that sixth-grade students held favorable attitudes toward the FLC model and the Shad application as a social platform. Students believed that their performance and literacy could be enhanced through the FLC model. The study suggested pedagogical implications for second language teaching, emphasizing the importance of creating content and materials in environmental education. Recommendations included raising awareness among teachers and institutions and providing guidelines for effective English grammar practice both inside and outside the classroom. Another notable finding was that the FLC model promoted both individual and group learning. It allowed students to connect with teachers and themselves, encouraging grammar practice at home and in-class exercises. The study highlighted the diverse learning paces of students and how the FLC model accommodated their needs and preferences. The instructor, acting as a facilitator, fostered an engaging learning environment, promoting active learning and collaborative activities. Despite the positive outcomes, the literature review indicated a lack of sufficient data for long-term comparisons between flipped and standard classroom practices, emphasizing the need for further research. In summary, the FLC model was deemed promising and innovative, enhancing learning experiences and teacher awareness. The study's results underscored the importance of a positive student attitude and improved learning outcomes in the FLC process. Previous experience and knowledge of implementing FLC in EFL elementary classrooms were identified as factors that could enhance an instructor's effectiveness. The study's implications extended to teachers, students, administrators, and curriculum designers. English educators were encouraged to incorporate flipped classroom elements into teaching activities, leveraging multimedia resources and learner-centric strategies. The study also had implications for the future of grammar teaching, particularly in language institutes in Iran. The creative method used in the study encouraged teachers to adopt learner-centric strategies, increasing student participation. Curriculum designers were urged to integrate flipped learning into syllabi and materials, emphasizing the need for technology incorporation. Administrators were advised to understand and leverage technology, providing teacher education programs to enhance computer skills. English language schools in Iran were encouraged to incorporate FLC teaching strategies, adapting to the technology-driven generation. Textbook authors were urged to create interactive content to engage the digital-native generation effectively.

The following recommendations could be made based on our results:

1. Teachers can use appropriate educational films and animations to bring diversity and attractiveness to teaching on the joyful educational network.
2. Teachers should make the most of the capacities available in e-learning, such as speed, accuracy, ease of information transfer, and so on.
3. Teachers should encourage students as much as possible in the lifelong learning journey, considering the absence of time and location constraints in e-learning.
4. Teachers should make the most of the capacities of e-learning in the joyful network, optimizing the learning pace for students with different scientific abilities.
5. They can benefit from the absence of physical presence of students in electronic education and the elimination of many peripheral issues such as behavioral abnormalities, overcrowding, sensitive factors such as age, language, appearance, disabilities, etc., to facilitate classroom management.
6. Parents should create a calm and suitable environment for their young children's e-learning at home, whenever possible.
7. The government and charitable organizations should aid in obtaining necessary tools and equipment for e-learning to students, teachers, and schools.
8. Alongside virtual classes, with the necessary considerations, opportunities for in-person activities such as laboratory experiments, workshops, extracurricular scientific-cultural activities, etc., should be created.

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