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The Impact of Flipped Learning on Reading Comprehension Among Moroccan High School Students: A Quasi-Experimental Study

Ouadiha El Jemli
Hassan II University, Mohammedia, Morocco
Wadihaeljemli5@gmail.com

Mounir Serhani
Hassan II University, Mohammedia, Morocco
serhanimounir@gmail.com

Imad Hamdanat
Moulay Ismail University, Meknes, Morocco
i.hamdanat@edu.umi.ac.ma

Lamiae Azzouzi
Moulay Ismail University, Meknes, Morocco
azzouzilamiae@gmail.com

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Abstract

This study investigated the efficacy of flipped learning in enhancing high school students' reading comprehension competencies. A quasi-experimental design was employed to compare a group of 85 second-year baccalaureate students exposed to flipped learning with a traditionally taught control group. The study employed pre- and post-tests to measure reading comprehension, with statistical analyses conducted to determine the impact of the intervention. Paired samples t-tests revealed significant improvements in reading comprehension for both the experimental and control groups, indicating that both instructional approaches can positively influence reading proficiency. However, independent samples t-tests did not demonstrate a significant difference in the magnitude of these improvements between the two groups, suggesting that while flipped learning may be an effective strategy, its superiority over traditional instruction in this context is not evident. The findings contribute to the ongoing discourse on the effectiveness of flipped learning. While the study indicates potential benefits of the flipped classroom approach, further research is warranted to explore the specific factors influencing its impact on student outcomes. Factors such as the quality of instructional materials, teacher training, and student characteristics may moderate the relationship between flipped learning and reading comprehension. Additionally, longitudinal studies are needed to examine the long-term effects of this instructional approach. By addressing these limitations and expanding the scope of future research, a more comprehensive understanding of the potential of flipped learning to enhance reading comprehension can be achieved.

1. INTRODUCTION

The integration of technology into education has ushered in a new era of teaching and learning, with innovative approaches such as project-based learning (PBL) and flipped learning

gaining significant traction. Flipped learning, which emphasizes student-centered inquiry and collaborative projects, has been shown to enhance critical thinking skills across various subjects and educational contexts (Alawi & Soh, 2019; Anazifa & Djukri, 2017). This pedagogical approach aligns with the growing emphasis on developing soft skills such as communication, teamwork, and problem-solving, which are crucial for success in today's dynamic workplace (Robles, 2012).

In particular, critical thinking has emerged as a key skill that can be effectively fostered through flipped learning. Studies have demonstrated that flipped learning not only improves students' critical thinking abilities but also enhances their motivation and engagement (Ansori, Wasis, & Nasrudin, 2019; Cash, 2017; Gunay et al., 2019). In the context of Moroccan education, integrating flipped learning can address the need for more interactive and student-centered learning environments, as highlighted by Amrous and Nejmaoui (2016).

Moreover, the efficacy of flipped learning in improving student outcomes, including reading comprehension and critical thinking, has been well-documented. This instructional approach, which shifts content delivery outside the classroom and dedicates class time to collaborative learning, has been found to create more engaging and active learning environments (Bishop & Verleger, 2013; Hamdan et al., 2013). However, the impact of flipped learning within specific cultural and educational contexts, such as Morocco, requires further exploration (Wiranata, Arisanti, & Hasanah, 2023).

Morocco, with its growing emphasis on English language education and the integration of technology in schools, presents an opportune setting to explore the impact of innovative teaching approaches on student outcomes. This study aims to contribute to the existing body of knowledge by examining the relationship between flipped learning and reading comprehension among Moroccan high school students. By comparing the reading comprehension performance of students exposed to flipped learning with those taught through traditional methods, this research seeks to inform educational practices and policies in Morocco.

Ultimately, this study aims to inform educational practices and policies in Morocco by providing empirical evidence on the effectiveness of flipped learning in improving reading comprehension. The findings of this research could contribute to the development of more effective instructional strategies aimed at enhancing students' literacy skills and overall academic achievement.

The subsequent sections of this paper will delve into the theoretical framework underpinning flipped learning and reading comprehension, outline the research methodology employed, present the findings of the study, and discuss the implications of the results for educational practice and future research.

2. LITERATURE REVIEW

2.1.Introduction

The integration of technology has significantly reshaped educational practices worldwide (Khaloufi & Laabidi, 2017). Among these advancements, flipped learning, pioneered by Lage, Platt, and Treglia (2000), has emerged as a promising approach. This innovative pedagogy inverts traditional classroom dynamics by shifting content delivery outside the classroom, typically through pre-recorded lectures or online resources. In-class time becomes dedicated to collaborative learning activities, problem-solving exercises, and deeper

exploration of the pre-taught concepts. This shift aims to enhance student engagement and foster a more comprehensive understanding of subject matter.

Reading comprehension, a cornerstone of academic success, has long been a focus in educational research (Chall, 1983; Larouz, 2012). However, the effectiveness of traditional instructional methods in cultivating proficient readers remains a topic of debate. In this light, flipped learning presents a potential avenue for improving students' ability to comprehend and interpret written text (Hamdanat, 2024). The integration of technology and active learning strategies inherent in flipped learning aligns with contemporary perspectives on effective reading instruction, as advocated by Duke & Pearson (2007).

This study aims to investigate the impact of flipped learning on reading comprehension among Moroccan high school students. By comparing the reading comprehension performance of students exposed to flipped learning with those taught through traditional methods, this research seeks to contribute to the growing body of knowledge on effective instructional strategies in the Moroccan context.

2.2.Theoretical Framework

Flipped learning, as conceptualized by Lage, Platt, and Treglia (2000), represents a pedagogical shift that inverts traditional classroom dynamics. In this model, students engage with instructional content independently outside of class, typically through pre-recorded lectures or online resources. This allows class time to be dedicated to collaborative learning activities, problem-solving, and deeper engagement with the subject matter. This approach aligns with constructivist learning theories, which emphasize the active role of learners in constructing knowledge through interaction with their environment and peers (Piaget, 1936). By providing students with opportunities to apply their knowledge in real-world contexts and collaborate with classmates, flipped learning fosters a deeper level of understanding.

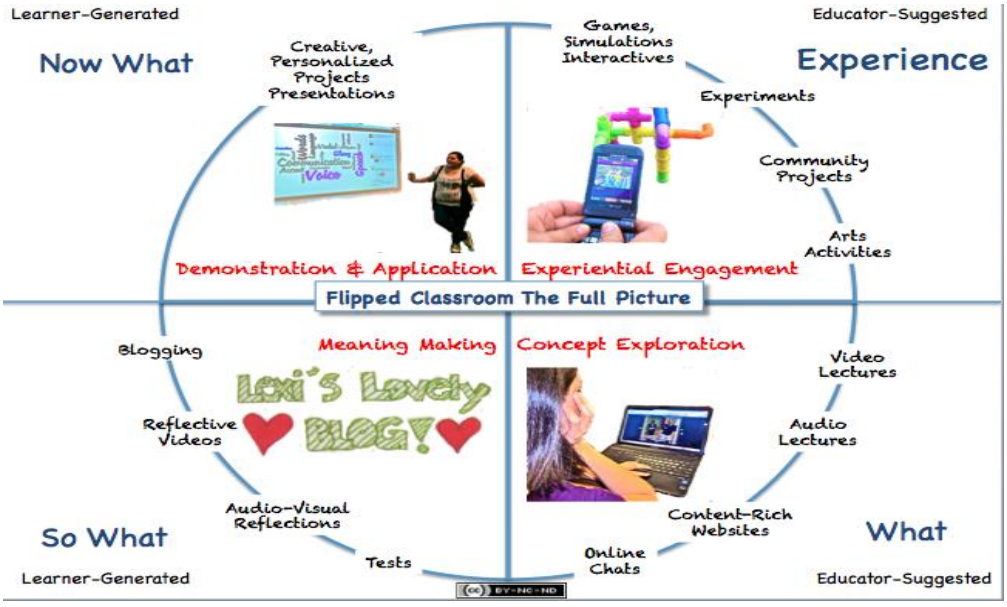

Figure 1. Flipped learning Model (Lobdell, 2013, p. 4)

2.3.The constructivist paradigm in flipped learning

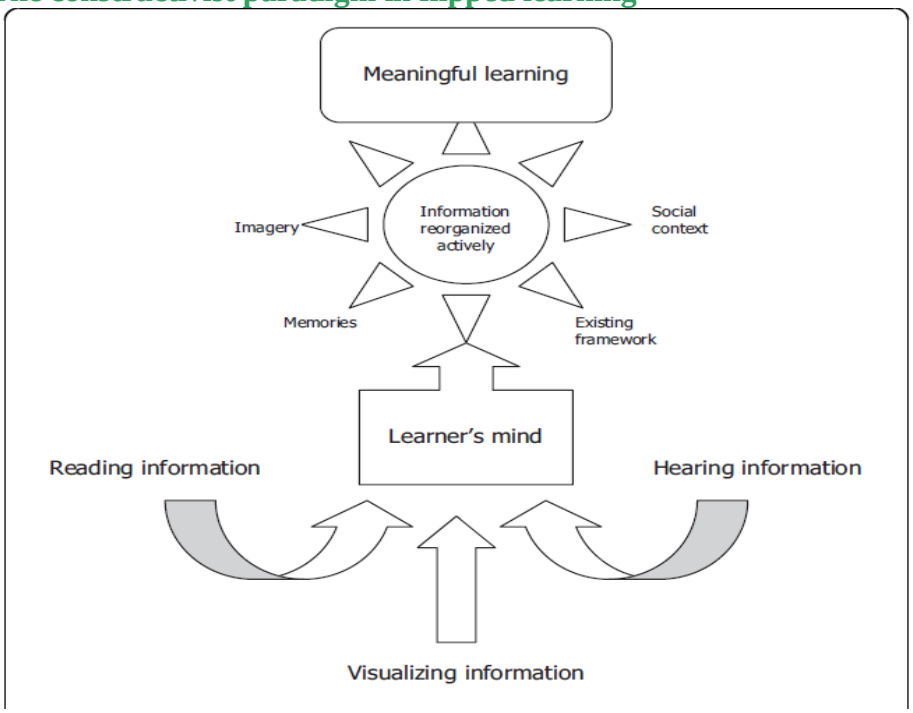

Figure 2: Constructivist learning theory of learning (D'antoni et al., 2010, P,3)

The integration of technology into education has commenced in a new era of teaching and learning, with flipped learning emerging as a prominent pedagogical innovation (Love, Hodge, Grandgenett, & Swift, 2014). This instructional approach, which inverts traditional classroom dynamics by shifting content delivery outside the classroom and dedicating class time to collaborative learning, has gained significant traction in recent years (Bishop & Verleger, 2013). Proponents of flipped learning argue that it fosters a more active and engaging learning environment, potentially leading to improved student outcomes (Hamdan et al., 2013).

Reading comprehension, a cornerstone of academic success, remains a critical focus in education (National Reading Panel, 2000). While traditional instructional methods have been widely implemented, their effectiveness in developing proficient readers has been subject to ongoing debate (Alvermann, 2012). The integration of technology and innovative teaching approaches, such as flipped learning, offers promising avenues for enhancing reading comprehension (Hung, 2015). However, the efficacy of flipped learning in improving reading comprehension, particularly within specific cultural and educational contexts, requires further investigation (Wiranata, Arisanti, & Hasanah, 2023).

Constructivism, a learning theory positing that individuals actively construct knowledge through experiences and reflections, aligns closely with the principles of flipped learning. In flipped learning, students engage with content independently before class, allowing them to construct initial understandings (Brame, 2013). This aligns with the constructivist idea that learners build knowledge based on prior experiences (Piaget, 1954). By shifting the focus of classroom time to collaborative activities and problem-solving, flipped learning provides opportunities for students to share their constructed knowledge, engage in dialogue, and refine their understanding (Bergmann & Sams, 2012). This process, central to constructivism, encourages students to question, challenge, and negotiate meaning with peers, leading to a deeper and more robust comprehension of the subject matter (Hamdanat, 2024; Kim, 2017).

Research has shown that flipped learning can significantly enhance student engagement and achievement. For instance, Lage, Platt, and Treglia (2000) found that students in a flipped classroom were more active participants in their learning process. Similarly, Strayer (2012) reported that students in a flipped learning environment experienced higher levels of engagement and interaction compared to traditional classrooms. Furthermore, the collaborative aspect of flipped learning aligns with Vygotsky's (1978) social constructivist theory, which emphasizes the importance of social interaction in cognitive development.

Morocco, with its growing emphasis on English language education and the integration of technology in schools (Ministry of Education, Morocco, 2023), presents an opportune setting to explore the impact of flipped learning on reading comprehension. This study aims to contribute to the existing body of knowledge by examining the relationship between flipped learning and reading comprehension among Moroccan high school students. By comparing the reading comprehension performance of students exposed to flipped learning with those taught through traditional methods, this research seeks to inform educational practices and policies in Morocco, aligning with the national vision of educational reform (Ministry of Education, Morocco, 2020).

2.4.Cognitive load theory and flipped learning:

The flipped learning model is also underpinned by cognitive load theory, which suggests that learners have limited cognitive capacity to process information (Sweller, 1988). By separating content delivery from application, flipped learning can reduce learners' cognitive load during class time, allowing them to focus on higher-order thinking skills and problem-solving. Additionally, flipped learning can accommodate individual learning paces, as students can review pre-recorded materials at their own speed.

2.5.Active Learning in Flipped learning

Active learning is a pedagogical approach that places students at the center of the learning process, encouraging them to engage with the material through activities such as problem-solving, discussion, and inquiry. This approach contrasts with traditional passive learning methods, where students primarily receive information through lectures. Research has shown that active learning promotes deeper understanding, critical thinking, and the application of knowledge (Freeman et al., 2014).

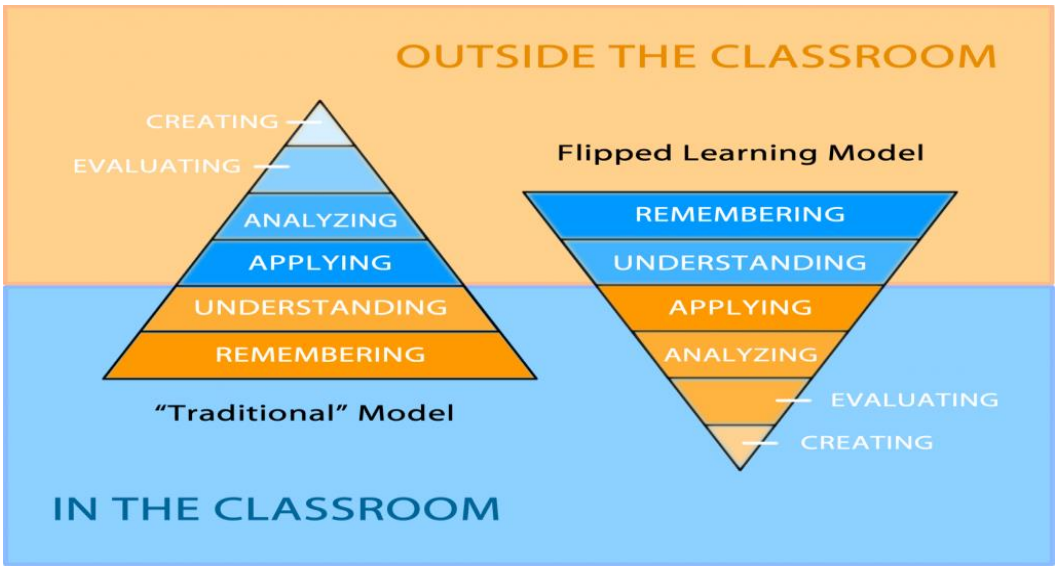

Figure 3: Flipped learning Model skills (University of Minnesota, n.d.)

Flipped learning is inherently aligned with active learning principles. By shifting content delivery outside of the classroom, this innovative model frees up valuable class time for interactive activities that enhance student engagement. For instance, studies by Lage, Platt, and Treglia (2000) and Abeysekera and Dawson (2015) highlight that flipped learning facilitates various active learning strategies, including group discussions, problem-solving exercises, case studies, simulations, and peer teaching. These methods are designed to foster collaboration, encourage the application of theoretical knowledge, and develop higher-order thinking skills.

Moreover, flipped learning creates an environment where students are actively involved in the learning process. This shift transforms students from passive recipients of information into active participants in their own education, engaging them in the construction of knowledge. According to Strayer (2012), this participatory approach can lead to improved academic outcomes, as students are more likely to retain information and apply it in novel contexts.

Overall, the integration of active learning strategies in flipped learning not only enhances student engagement but also promotes critical thinking and deeper understanding of the subject matter. The effectiveness of this pedagogical approach is well-documented in educational research, underscoring the value of active learning in modern educational settings (Wiranata, Arisanti, & Hasanah, 2023).

2.6.Empirical Evidence on Flipped Learning Effectiveness

Research on the effectiveness of flipped learning has produced mixed results. Some studies have reported positive impacts on student engagement, motivation, and academic performance. For instance, Bishop and Verleger (2013) conducted a comprehensive review that found flipped learning often lead to improved student engagement and learning outcomes. Similarly, Hamdan et al. (2013) highlighted that flipped learning can enhance student-centered learning experiences, promoting active engagement and deeper understanding of the material. However, other studies have found more modest effects or even negative outcomes, suggesting that the success of flipped learning implementations may depend on several contextual factors.

Factors such as the quality of instructional materials, the level of teacher preparation, and student characteristics play critical roles in determining the effectiveness of flipped learning (Bishop & Verleger, 2013; Hamdan et al., 2013). It is crucial to carefully consider these variables when interpreting research findings and designing flipped learning interventions.

The potential of flipped learning to enhance reading comprehension has garnered increasing attention in educational research. This instructional approach, which inverts traditional classroom dynamics, offers unique opportunities for students to engage deeply with textual materials. By providing students with access to content outside of class, flipped learning allows for more in-depth exploration and analysis of texts during class time (Lage, Platt, & Treglia, 2000). This increased engagement with text can potentially lead to improved reading comprehension.

Several studies have specifically examined the relationship between flipped learning and reading outcomes. For example, Hung (2015) found that students in flipped learning

demonstrated significantly higher levels of reading comprehension compared to their peers in traditional classrooms. Similarly, Leis, Tohei, and Cooke (2015) reported that flipped learning positively impacted students' abilities to analyze and interpret complex texts. These findings suggest that flipped learning can be an effective strategy for enhancing reading comprehension, but its success can vary depending on the context.

To optimize the impact of flipped learning on reading comprehension, it is essential to consider factors influencing its effectiveness. These include ensuring alignment between pre-class materials and in-class activities, providing adequate support for struggling readers, and creating a classroom culture that fosters active engagement and critical thinking. Additionally, the integration of technology tools that facilitate reading comprehension, such as text-to-speech features and interactive reading platforms, can further enhance the benefits of flipped learning. Therefore, educators and policymakers should focus on these critical factors to maximize the potential of flipped learning in improving reading comprehension skills (Wiranata, Arisanti, & Hasanah, 2023)..

2.7.Flipped Learning in the Moroccan Context

The Moroccan educational landscape, characterized by a combination of traditional and modern pedagogical approaches, offers a unique context for investigating the potential of flipped learning methodologies. Despite significant advancements in technology integration, with increased accessibility to digital resources, challenges such as infrastructure disparities and insufficient teacher training continue to hinder the widespread adoption of innovative pedagogical practices. The concept of flipped learning, although gaining global traction, remains underexplored within the Moroccan context. Existing literature indicates a nascent stage of research focused on flipped learning, particularly in its application to enhance reading comprehension among Moroccan high school students (Jaafari, 2019).

Studies by Chaoui and Benmoussa (2020) underscore the feasibility challenges of implementing flipped learning in Moroccan classrooms, emphasizing the need for further exploration of its impact on student outcomes. Globally, flipped learning has been associated with improved student engagement and academic performance across various disciplines (Lo & Hew, 2017). However, its integration into the Moroccan educational system faces significant obstacles. Research by Zainuddin and Halili (2016) highlights common barriers to the adoption of flipped learning, including technological constraints, inadequate teacher professional development, and cultural resistance to student-centered learning approaches.

The potential benefits of flipped learning in enhancing student engagement and learning outcomes, particularly in reading comprehension, have been documented in various contexts (Hung, 2015). Nonetheless, the successful implementation of flipped learning in Morocco necessitates addressing infrastructural limitations, providing comprehensive teacher training, and fostering a cultural shift towards more interactive and student-centered learning environments. This requires a coordinated effort among policymakers, educators, and researchers to establish a supportive framework that can facilitate the effective integration of flipped learning in Moroccan schools (Jaafari, 2019).

In a nutshell, the literature review on flipped learning and reading comprehension highlights the potential of this instructional approach to enhance student engagement and

learning outcomes. While research has shown promising results in various contexts, the specific impact of flipped learning on reading comprehension among Moroccan high school students remains understudied (Ben Mesaoud et al., 2023).

A key finding from the literature is the importance of considering contextual factors, such as technology infrastructure, teacher training, and student characteristics, when implementing flipped learning. Additionally, the integration of flipped learning with other instructional strategies, such as cooperative learning and differentiated instruction, may be essential for maximizing its effectiveness (Rachid & Sakale, 2023).

Despite the growing body of research on flipped learning, several gaps remain. For example, there is a need for longitudinal studies to examine the long-term effects of flipped learning on reading comprehension. Furthermore, research on the cost-effectiveness of flipped learning compared to traditional instruction is limited. Addressing these gaps through future research will contribute to a deeper understanding of the potential and limitations of flipped learning as a pedagogical approach (Wahib & Tamer, 2021). By building upon the existing body of knowledge and addressing these research gaps, future studies can provide valuable insights for educators, policymakers, and researchers seeking to improve reading comprehension outcomes for students.

3. METHODOLOGY

This study aims to investigate the effect of flipped learning on high school students' reading proficiency. In addressing the identified issue and its implications, research questions have been meticulously developed to guide the examination of language proficiency and the flipped learning model. Given the primary objective of assessing the impact of flipped learning on reading ability, the following research question will be examined:

RQ: Does flipped learning significantly improve reading comprehension among Moroccan high school students compared to traditional instruction?

3.1.Research design

This study employed a quasi-experimental design to investigate the impact of flipped learning on reading comprehension among Moroccan high school students. This research design, as described by Creswell and Poth (2018), was chosen due to the practical constraints of randomly assigning participants to experimental and control groups within an intact classroom setting. This approach, also advocated by Aguinis (2017), allows for the comparison of two groups of students: an experimental group exposed to flipped learning and a control group receiving traditional instruction. Both groups were administered pre and post-reading comprehension tests to measure the effects of the intervention. While this design does not offer the same level of control as a true experiment, it provides valuable insights into the effectiveness of flipped learning in the target population.

3.2.Population and sampling

The study population consisted of 85 second-year baccalaureate high school students from Al Mansour Addahbi High School, representing a middle-class socioeconomic background. Participants were divided into two groups: an experimental group (n=42) exposed to flipped learning and a control group (n=43) receiving traditional instruction. The sample included 60% female and 40% male students.

3.3.Data Collection Instruments

To assess reading comprehension, standardized reading comprehension tests were administered to both the experimental and control groups as pre-tests and post-tests. These tests were adapted from previous baccalaureate exams and teacher-made assessments to ensure alignment with the curriculum and to measure a wide range of reading skills. The tests comprised a variety of question types, including true/false with justification, direct questions, matching, word reference, and paraphrasing of text sentences. This approach aimed to comprehensively evaluate participants' reading comprehension abilities.

3.4.Piloting

Prior to the main study, a pilot test was conducted involving 10 students to assess the reliability and validity of the reading comprehension tests. The results of the pilot test yielded a Cronbach's alpha coefficient of 0.82, indicating a satisfactory level of internal consistency among the test items. Based on the pilot data and feedback from teachers, minor adjustments were made to the test items, such as rephrasing certain questions to enhance clarity and avoid potential difficulties for students. These modifications were implemented to improve the overall quality of the assessment instruments.

3.5.Data collection procedures

The present study involved 85 second-year baccalaureate students from Al Mansour Addahbi High School in Sidi Kacem during the 2023-2024 academic year. Participants were divided into two groups: an experimental group exposed to flipped learning and a control group receiving traditional instruction. A convenience sampling approach was employed to select the participants.

A quasi-experimental design was utilized, with pre- and post-reading comprehension tests administered to both groups. The experimental group engaged in a flipped classroom environment equipped with technological resources, including computers, projectors, and internet connectivity. Students were provided with reading materials and audio files via WhatsApp, engaging in pre-class activities such as reading, listening, and discussion. In-class activities focused on interactive learning, including questioning, brainstorming, and text analysis. Both tests had a duration of 90 minutes. After a one-month intervention, a post-test was administered to both groups. Data were analyzed using SPSS version 21.

3.6.Data Analysis Procedures

To analyze the collected data, descriptive statistics were employed to summarize the demographic characteristics of the participants and to examine the distribution of reading comprehension scores in both the experimental and control groups. Independent samples t-tests were conducted to compare the mean reading comprehension scores between the two groups at pre-test and post-test stages. To assess the effectiveness of the flipped learning intervention, a repeated measures ANOVA was utilized to examine changes in reading comprehension scores over time within each group. Additionally, effect sizes were calculated to estimate the magnitude of the treatment effect.

4. RESULTS

4.1.Descriptive Statistics

This sub-section focuses on analyzing the impact of flipped learning on high school students' reading proficiency. The primary objective is to determine whether the experimental group, exposed to flipped learning, exhibited significantly higher reading comprehension scores compared to the control group taught through traditional methods. To address this, the study employed a quasi-experimental design with pre- and post-tests. It is important to note that this sub-section aims to address the research question and determine whether to accept or reject the hypothesis. The details are as follows:

RQ: Does flipped learning significantly improve reading comprehension among Moroccan high school students compared to traditional instruction?

DH: Students under the flipped learning model will demonstrate superior reading comprehension compared to those under the traditional learning model.

The null hypothesis being examined in this analysis is as follows:

NH: There is no significant difference in reading comprehension scores between students under the flipped learning model and those under the traditional learning model.

To test these hypotheses, a paired samples t-test was conducted to assess changes in reading comprehension within each group over time. Subsequently, an independent samples t-test was employed to compare the post-test scores between the experimental and control groups. The results of these analyses, presented in subsequent tables (Paired Samples Statistics, Paired Samples Correlations, Paired Samples Test, and Independent Samples Test), will illuminate the efficacy of flipped learning in enhancing reading comprehension among Moroccan high school students.

Table 1 :Descriptive Statistics of pre-test and post-test

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	12,7118	85	1,36795	,14838
	Posttest	16,9706	85	1,11631	,12108

The paired samples statistics reveal a mean pre-test reading comprehension score of 12.7118 and a mean post-test score of 16.9706, indicating an increase in scores from pre-test to post-test. The standard deviation for the pre-test (1.36795) is slightly higher than that of the post-test (1.11631), suggesting a more consistent performance among participants on the post-test. These descriptive statistics provide preliminary evidence of a potential positive impact of the intervention on reading comprehension. However, inferential statistical tests are necessary to determine the statistical significance of this observed difference.

Table2 : Paired Samples Correlations

	N	Correlation	Sig.

Pair 1 Pretest & Posttest	85	,006	,956

The paired samples correlations table indicates a negligible correlation (r = .006) between pre-test and post-test reading comprehension scores. The non-significant p-value of .956 further supports the absence of a meaningful relationship between the two variables. This suggests that students' initial reading performance had little to no impact on their subsequent performance after the intervention. This finding suggests that the flipped learning intervention may have had a relatively equalizing effect on students' reading comprehension, regardless of their initial performance levels.

Table 3 : Paired Samples T-Test

	Paired Differences					t	df	Sig. (2-tailed)
	Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
				Lower	Upper			
Pair 1 Pretest - Posttest	-4,25882	1,76036	,19094	-4,63853	-3,87912	-22,305	84	,000

The paired samples t-test results indicate a statistically significant difference in reading comprehension scores between the pre-test and post-test (t = -22.305, p < .001). The negative mean difference of -4.25882 suggests a substantial improvement in reading comprehension scores from pre-test to post-test. The confidence interval for the mean difference does not include zero, further supporting the conclusion that the observed difference is unlikely to be due to chance. Overall, these findings provide strong evidence that the intervention had a positive impact on students' reading comprehension.

Table 5 : Independent Samples T-Test

		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	,942	,334	1,521	83	,132	,36545	,24031	-,11251	,84341
	Equal variances not assumed			1,520	82,497	,132	,36545	,24046	-,11287	,84376

The independent samples t-test was conducted to compare the mean difference in reading comprehension scores between the control and experimental groups. Levene's test for equality of variances indicated that the assumption of equal variances was not violated (p = .334), supporting the use of the pooled variance estimate. The t-test results revealed a significant difference in mean difference scores between the two groups (t = 1.521, p = .132). While there is a slight difference in favor of the control group, this difference is not statistically significant. Therefore, the data does not support the conclusion that the flipped learning intervention had a significant impact on improving reading comprehension scores compared to traditional instruction.

Table 6: Levene's Test of Equality of Error Variances[a]

Dependent Variable: Difference

F	df1	df2	Sig.
,168	1	83	,683

Tests the null hypothesis that the error variance of the dependent variable is equal across groups.

a. Design: Intercept + Group

The Levene's test was conducted to assess the homogeneity of variances in the mean differences between pre-test and post-test scores for the control and experimental groups. The non-significant F-value of .168 and the associated p-value of .683 indicate that there is no significant difference in the variances of the two groups. This suggests that the assumption of equal variances is met, supporting the validity of the parametric t-test used to analyze the data.

4.2.Discussion of the results

The current study aimed to evaluate the effectiveness of flipped learning in enhancing high school students' reading comprehension. While both the experimental and control groups demonstrated significant improvements in reading scores (paired samples t-test), the independent samples t-test revealed no significant difference between the groups in terms of the magnitude of these gains. These findings align with previous research by Talbert et al. (2017), suggesting that flipped learning can be an effective strategy, but its superiority over traditional methods is not always evident.

Several factors may have contributed to the lack of a significant difference between the flipped learning and control groups. Ainsworth (2013) emphasizes that sociological factors within educational contexts can significantly influence learning outcomes. The specific classroom environment, teacher characteristics, and student demographics may have interacted with the flipped learning intervention in complex ways. For instance, the study by Vaughan (2014) highlighted how teacher experience and comfort with technology can impact the effectiveness of flipped classrooms. In our study, variations in these factors might have diluted the potential advantages of the flipped learning approach.

Additionally, the relatively short duration of the study might have limited the potential for observing substantial differences between groups. Bishop and Verleger (2013) noted that the benefits of flipped learning might become more apparent over longer periods, as students and teachers adapt to the new instructional model. Moreover, a study by Gilboy, Heinerichs, and

Pazzaglia (2015) found that students required time to adjust to the increased responsibility and self-regulation demanded by flipped learning, suggesting that longer implementation periods are necessary for fully capturing its impact.

The limitations of this study, including the use of a convenience sample and a relatively small sample size, might have influenced the results and limited the generalizability of the findings. Arikunto (2005) argues that these methodological constraints can affect the robustness of educational research. Moreover, Baepler, Walker, and Driessen (2014) emphasize that other variables, such as student motivation, prior knowledge, and teacher expertise, could have impacted the outcomes. For instance, students with higher intrinsic motivation and better self-regulation skills may have been better positioned to benefit from the flipped learning model.

The quality of instructional materials is another crucial factor that may have contributed to the lack of significant differences between the groups. Effective flipped learning relies on well-designed and engaging video content or other resources that support students' independent learning (DeLozier & Rhodes, 2017). If the instructional materials used in this study were not of sufficient quality or did not adequately address the learning objectives, it could have limited the impact of the intervention. Furthermore, the study by Tune, Sturek, and Basile (2013) found that inconsistencies in how teachers implemented the flipped learning model could influence student outcomes. Variations in the fidelity of implementation might have similarly affected the results in our study.

The role of student motivation and self-regulation cannot be overlooked. While flipped learning can empower students to take control of their learning, it also places greater responsibility on them to engage with the materials independently (Zimmerman, 2008). Students with strong self-regulation skills may have benefited more from the flipped learning approach, while those with lower levels of motivation or self-discipline may have struggled. A study by He, Holton, and Farkas (2021) found that student engagement and self-regulation skills were significant predictors of success in flipped learning environments.

In a nutshell, while the findings of this study do not provide conclusive evidence of the superiority of flipped learning over traditional instruction in enhancing reading comprehension, they contribute to the ongoing discourse on effective pedagogical approaches. The results highlight the complex interplay of various factors influencing student outcomes and emphasize the need for further research to elucidate the conditions under which flipped learning is most effective. Future studies should explore the long-term impacts of flipped learning, investigate the role of teacher training and support, and examine the interaction between flipped learning and other instructional interventions. By addressing these research questions, we can gain a deeper understanding of the potential benefits and challenges of implementing flipped learning in diverse educational contexts.

5. CONCLUSION

5.1. Key Contributions of the Research

The present study sought to investigate the impact of flipped learning on high school students' reading comprehension. By employing a quasi-experimental design, the study compared the reading performance of students exposed to flipped learning with those taught through traditional methods. The results indicated that both instructional approaches led to significant improvements in reading comprehension, as evidenced by the paired samples t-test.

However, the independent samples t-test failed to reveal a significant difference between the two groups in terms of the magnitude of these improvements.

These findings suggest that while flipped learning can be an effective strategy for enhancing reading comprehension, it may not necessarily outperform traditional instruction in achieving this outcome. The results of this study align with previous research that has reported mixed findings on the efficacy of flipped learning (e.g., Talbert, Bergstrom, & Ross, 2017). It is important to note that the current study was subject to limitations, including the use of a convenience sample and the relatively short duration of the intervention. These factors may have influenced the results and limited the generalizability of the findings.

Future research should explore the potential moderating effects of student characteristics, such as prior knowledge, learning styles, and motivation, on the outcomes of flipped learning interventions. Additionally, investigating the optimal components of flipped learning, including the design of instructional videos, in-class activities, and student support, is essential for maximizing its effectiveness. Longitudinal studies are also needed to examine the long-term impacts of flipped learning on reading comprehension and overall academic achievement.

By addressing these research gaps, future studies can provide a more comprehensive understanding of the conditions under which flipped learning is most effective and inform the development of evidence-based instructional practices. Ultimately, the goal is to leverage the potential of technology-enhanced learning to improve student outcomes while considering the diverse needs and contexts of learners and educators.

5.2.Implications

Based on the findings of this study, several implications have emerged that could enhance language teaching and learning practices and outcomes. The following subsections outline the implications for language teachers, syllabus designers, and other stakeholders.

5.2.1. Implications for Language Teachers

Language teachers should carefully consider the implications of these findings when integrating flipped learning into their classrooms, particularly within the context of limited resources. While the results indicate that both flipped and traditional instruction can lead to improvements in reading comprehension, the lack of a significant difference between the two groups suggests that flipped learning may not be a panacea for addressing all students' needs, especially in resource-constrained environments. Teachers should be prepared to adapt their instructional strategies based on student characteristics, learning styles, and the availability of resources.

Furthermore, the effective implementation of flipped learning requires careful planning and preparation, which can be challenging in resource-constrained settings. Teachers may need to creatively utilize available technology and materials to develop engaging instructional content. For instance, low-cost solutions such as using mobile phones for accessing educational videos or creating simple, yet effective, paper-based activities can help overcome technology limitations. Additionally, providing opportunities for students to collaborate and discuss the content during class time may require careful organization and management of classroom space and resources.

Teachers might also need to invest extra time in training and professional development to enhance their ability to effectively integrate flipped learning. Peer collaboration and sharing best practices within the teaching community can help mitigate some of the challenges posed by limited resources. Moreover, teachers should be flexible and willing to modify flipped learning strategies based on ongoing feedback and observed student outcomes.

5.2.2. Implications for Syllabus Designers

Syllabus designers should incorporate a balanced approach to instructional methods, considering the strengths and limitations of both flipped learning and traditional instruction, particularly in light of resource constraints. While flipped learning offers opportunities for student-centered learning and independent study, it is essential to ensure that the syllabus is feasible and achievable within the available **resources.**

To effectively integrate flipped learning into the curriculum, syllabus designers should prioritize the selection of content that can be accessed by the majority of students. This may involve curating open educational resources (OERs) or locally produced materials that are freely available and easily accessible. Additionally, the syllabus should include opportunities for offline activities and collaborative learning to accommodate students who may have limited access to technology. Designing flexible instructional plans that allow for both digital and non-digital learning experiences can help ensure inclusivity.

Syllabus designers should also consider the professional development needs of teachers. Providing comprehensive training on how to effectively implement flipped learning and develop high-quality instructional materials can enhance the overall impact of the syllabus. Moreover, incorporating feedback mechanisms to continuously refine and adapt the syllabus based on practical classroom experiences can lead to more effective teaching and learning outcomes.

5.2.3. Implications for Education Stakeholders

Education stakeholders, including policymakers, administrators, and school leaders, play a crucial role in supporting the successful implementation of flipped learning, especially in resource-constrained environments. Investing in teacher training, providing access to technology, and developing appropriate infrastructure are essential for creating a supportive learning environment.

To address the challenges posed by resource constraints, education stakeholders should explore innovative approaches to technology access, such as shared device programs or mobile learning initiatives. For example, establishing community resource centers where students can access digital content outside of school hours or utilizing low-cost tablets and smartphones for educational purposes can help bridge the technology gap. Additionally, prioritizing professional development opportunities focused on effective flipped learning implementation in resource-limited settings can empower teachers to maximize the potential of this instructional approach.

Stakeholders should also advocate for policies that support equitable access to educational resources and technology. This includes funding for infrastructure improvements, such as reliable internet connectivity and digital tools, as well as initiatives that promote digital literacy among students and teachers. By creating an environment where flipped learning can thrive, education stakeholders can help ensure that all students, regardless of their socio-economic background, have the opportunity to benefit from innovative instructional strategies.

Additionally, fostering partnerships with non-governmental organizations (NGOs), private sector companies, and international agencies can provide additional support and resources for implementing flipped learning. Collaborative efforts can lead to the development of tailored solutions that address the unique challenges faced by resource-constrained schools.

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About the authors

Ms. Ouadiha El Jemli ***is currently a high school Arabic language teacher at the Ministry of National Education in Morocco. She holds a Master's degree in Arts from Sidi Mohamed Ben Abdellah University in Fez and is a third-year doctoral researcher at Hassan II University in Casablanca. As a researcher, she is involved with the Knowledge Integration Laboratory in Humanities and Social Sciences at Hassan II University. Ouadiha has participated in numerous seminars and conferences and has published several articles in international peer-reviewed journals. Her skills include teaching Arabic language and literature, conducting scientific research, academic writing, and critical analysis. She can be reached via email at Wadihaeljemli5@gmail.com or by phone at +212 665 126 150.***

Dr. Mounir Serhani*, poet, translator, columnist, and novelist, is currently the Vice Dean and an academic at FLSH Mohammedia. An agrégé in French literature and a former student of ENS Lyon, he has published three poetry collections: Je vais au noir silencieux (L'Harmattan), J'ai vécu de t'attendre (Maison de la poésie au Maroc), and Nue comme nuit (Marsam). He has translated several Moroccan poets and is also the author of a philosophical essay, L'Islam au risque de l'interprétation (Club du livre), and a novel, Il n'y a pas de barbe lisse (Marsam). Le Hangar is his second novel. Additionally, Dr. Serhani has published several articles in peer-reviewed journals and has participated in numerous national and international conferences.*

Mr. Imad Hamdanat ***is a dedicated high school English teacher and a third-year doctoral candidate. He obtained his Master's degree in Applied Language Studies from Moulay Ismail University, Meknes, in 2021 and is currently enrolled in the Applied Linguistics doctoral program at the same university. Mr. Hamdanat is an active member of the Soft Skills (SS) Community and has participated in numerous national and international conferences. His academic interests lie in the fields of Teaching English as a Foreign Language (TEFL), soft skills studies, and language development, with a specialization in soft skills development.***

Dr. Lamiae AZZOUZI ***is a professor at Moulay Ismail University, Faculty of Arts and Humanities, Department of English Studies in Meknes. She also serves as a part-time teacher at ESISA School of Software Engineering and Applied Sciences in Fès. In her multifaceted role, Dr. AZZOUZI coordinates the Master's Program in Applied Linguistics, actively participates as a member of the Applied Linguistics Doctorate Laboratory, and heads the English Studies Department at the Faculty of Arts and Humanities in Meknes. Dr. AZZOUZI has made significant contributions to academia through her research and publications. Her scholarly work spans various fields, including gender studies, media studies, semiotics, and applied linguistics. Her dedication to advancing knowledge and her active involvement in multiple academic roles underscore her commitment to education and research.***