

# The Effectiveness of the Integration of ChatGPT into Flipped Classrooms from Teachers' and Learners' Perspectives

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## Abstract

This study investigates the integration of ChatGPT, an advanced AI language model, into the flipped classroom model for language teaching and its impact on learning outcomes. The flipped classroom approach shifts instructional content delivery to pre-class activities and emphasizes active learning during class time, potentially enhancing student engagement and academic performance. This research explores how ChatGPT can further augment this model by providing interactive and personalized language learning materials before class and facilitating dynamic in-class activities. Using a mixed-methods research design, qualitative data from surveys and interviews were analyzed first to provide deeper insights into the students' experiences and attitudes towards ChatGPT-supported learning. Quantitative data were then collected through a survey of 124 students across different levels of language learning (Year 2, Year 3, and Year 4), focusing on perceived effectiveness of ChatGPT, levels of engagement and interaction, potential negative impacts, and overall satisfaction. Findings indicate that the integration of ChatGPT significantly enhances student engagement, language proficiency, and overall satisfaction with the learning process, while also highlighting some concerns regarding its use. This study contributes to the growing body of literature on AI in education, demonstrating the potential of ChatGPT to transform language teaching and learning in a flipped classroom setting.

**Keywords:** effectiveness of chatGPT, flipped classroom, classroom activities, teachers' strategies in integration of ChatGPT, teachers', students' perceptions

## 1. Introduction

### 1.1 Background to the Study

The flipped classroom is an instructional strategy that inverts traditional teaching methods by delivering instructional content, often online, outside of the classroom. This approach allows classroom time to be utilized for engaging students in interactive activities, discussions, and hands-on learning experiences. The flipped classroom model involves students engaging with new material before class, typically through video lectures, readings, or multimedia resources, allowing them to learn at their own pace. This shifts the initial learning phase outside the classroom, enabling more effective use of in-class time for active learning. Teachers act as facilitators, guiding students through activities, providing feedback, and addressing individual learning needs (Bergmann & Sams, 2012).

One of the primary benefits of the flipped classroom is enhanced student engagement. Students are more motivated and involved as they participate actively in class activities rather than passively listening to lectures (Bishop & Verleger, 2013). This model also promotes personalized learning, as teachers can give more individualized attention during class, catering to the diverse needs of students and addressing specific misconceptions (Hamdan et al., 2013). Research indicates that the flipped classroom can lead to better academic performance and a deeper understanding of material, as students are more actively involved in the learning process (Gilboy, Heinerichs, & Pazzaglia, 2015). Additionally, students benefit from the flexibility to learn at their own pace outside of class, accommodating different learning styles and schedules (Herreid & Schiller, 2013).

However, the flipped classroom model does present several challenges. Ensuring all students have access to the necessary technology and internet connectivity can be a significant hurdle (Educause, 2012). There is also the issue of student accountability, as some students may not engage with the pre-class materials, which can hinder

their participation and success in in-class activities (Abeysekera & Dawson, 2015). For teachers, developing high-quality instructional videos and interactive class activities requires considerable time and effort (Bergmann & Sams, 2012). Moreover, both students and teachers may initially resist the flipped classroom model due to its departure from traditional teaching methods (Gilboy, Heinerichs, & Pazzaglia, 2015).

Implementing a flipped classroom effectively involves several key steps. Creating engaging and concise pre-class materials, such as videos and readings, is crucial. Resources like Khan Academy and teacher-created videos can be particularly effective. In-class activities should be designed to promote critical thinking and practical application of knowledge through group discussions, case studies, and hands-on projects. Clear communication about the purpose, benefits, and expectations of the flipped classroom is essential, along with providing structure and support to help students stay on track. Utilizing formative assessments can ensure students have engaged with pre-class materials and guide in-class activities. Continuous feedback from students about the flipped classroom experience is important for making necessary adjustments (Roehl, Reddy, & Shannon, 2013).

The integration of Artificial Intelligence (AI) in education is revolutionizing the traditional learning environment, offering new possibilities for personalized learning, administrative efficiency, and enhanced educational experiences (Luckin et al., 2016). One of the most significant contributions of AI in education is the ability to provide personalized learning experiences through platforms that analyze students' learning patterns, strengths, and weaknesses to create customized educational plans (Chen & Li, 2010). These platforms use algorithms to adjust the difficulty of tasks, recommend resources, and offer targeted feedback, ensuring that each student receives support tailored to their individual needs (Soni, 2020). Tools like adaptive learning systems and intelligent tutoring systems exemplify this approach, helping students learn at their own pace and in their preferred style (Graesser, Conley, & Olney, 2012). Additionally, AI has expanded the availability and quality of educational tools and resources, with virtual reality (VR) and augmented reality (AR) technologies providing immersive learning experiences, and AI-driven content creation tools generating interactive textbooks, quizzes, and educational games (Tsinakos & Ally, 2013). Language learning apps like Duolingo utilize AI to offer personalized lessons and practice sessions, making language acquisition more effective and enjoyable. However, the integration of AI into education also raises important ethical and privacy concerns (Perez-Perez, 2018). Issues related to data privacy, security, and the potential for bias in AI algorithms need to be addressed to ensure that AI applications are used responsibly and equitably (Floridi & Cowls, 2019). By embracing AI, educators can unlock new possibilities and create a more adaptive, efficient, and personalized learning environment for all students, while also addressing the ethical challenges associated with its implementation (Meyer, Rose, & Gordon, 2014).

The integration of ChatGPT into flipped classrooms represents a significant advancement in educational technology, offering the potential to address several existing challenges while enhancing the learning experience. This study is academically important for several reasons. First, it aims to empirically investigate how ChatGPT can enhance student engagement and personalized learning in a flipped classroom setting. Given the increased emphasis on student-centered learning approaches, understanding the effectiveness of AI tools like ChatGPT is crucial for developing more effective teaching strategies. Second, this research addresses the accessibility issues inherent in the flipped classroom model by leveraging ChatGPT to provide additional support and resources outside of class. This can help bridge the gap for students who may struggle with accessing or understanding pre-class materials, thus ensuring a more equitable learning environment. Additionally, by examining both teachers' and learners' perspectives, this study provides a comprehensive evaluation of the practical applications and challenges of integrating AI into educational settings. Furthermore, this study contributes to the broader field of educational research by exploring the ethical and practical implications of using AI in classrooms. As educational institutions increasingly adopt AI technologies, it is vital to understand their impact on teaching and learning dynamics. The findings from this research will inform best practices for AI integration, addressing concerns related to data privacy, algorithmic bias, and the overall efficacy of AI tools in education. Ultimately, this research aims to provide actionable insights for educators, policymakers, and technology developers on how to effectively integrate AI tools like ChatGPT into flipped classrooms to enhance learning outcomes, support personalized education, and ensure equitable access to educational resources.

### *1.2 Purpose of the Study*

The study aims at investigating how ChatGPT can be integrated into a flipped classroom for language teaching and its impact on learning outcomes. Firstly, the study aims to explore the effectiveness of integrating ChatGPT, a state-of-the-art language generation model, into the flipped classroom model. By leveraging ChatGPT's natural language processing capabilities, the study seeks to enhance pre-class learning experiences by providing students with interactive and personalized language learning materials (Radford et al., 2019). Additionally, the study aims to investigate the role of ChatGPT in facilitating in-class activities, such as group discussions, role-plays, and collaborative projects, within the flipped classroom setting. By serving as a virtual assistant during class sessions, ChatGPT can support student engagement, provide instant feedback, and foster interactive language practice (Zhang et al., 2020).

Furthermore, the study aims to assess the impact of ChatGPT integration on various learning outcomes in language teaching. This includes examining changes in students' language proficiency, comprehension skills, and overall academic performance. By comparing the learning outcomes of students exposed to ChatGPT-supported flipped classroom activities with those following traditional teaching methods, the study seeks to provide empirical evidence of the efficacy of this innovative approach (Devlin et al., 2019). Moreover, the study aims to explore students' perceptions, attitudes, and satisfaction levels regarding the use of ChatGPT in language learning contexts. By gathering qualitative data through surveys, interviews, and observations, the study intends to uncover insights into students' experiences and preferences regarding ChatGPT-supported flipped classroom instruction (Hao et al., 2020).

In summary, the purposes of the study are to investigate the effectiveness of integrating ChatGPT into a flipped classroom for language teaching, assess its impact on learning outcomes, and explore students' perceptions and attitudes towards this innovative instructional approach. By addressing these research objectives, the study aims to contribute to the growing body of literature on AI integration in education and provide valuable insights into the potential benefits and challenges of using ChatGPT in language learning contexts.

## **2. Literature Review**

### *2.1 A Review of Existing Research on the Flipped Classroom in Language Teaching*

The effectiveness of the flipped classroom in language teaching has been extensively studied, with research focusing on various aspects of student learning outcomes. Academic performance is a key area of investigation, with studies consistently reporting positive effects of the flipped classroom model. For example, Abeysekera and Dawson (2015) found that students in a flipped classroom environment achieved higher academic performance compared to those in traditional classrooms. Additionally, research suggests that the flipped classroom can lead to improvements in language proficiency. Bishop and Verleger (2013) reported significant gains in students' language skills, including speaking, listening, reading, and writing, following flipped instruction.

Student engagement and participation are also central to the discussion surrounding the flipped classroom model. Bergmann and Sams (2012) noted higher levels of student involvement and interaction during in-class discussions and activities in flipped language classrooms. Furthermore, students' perceptions and attitudes towards the flipped classroom model have been examined in several studies. Roehl, Reddy, and Shannon (2013) found that students generally expressed high levels of satisfaction with flipped instruction, citing increased engagement and a deeper understanding of language concepts. Herreid and Schiller (2013) reported that students appreciated the opportunity to engage in collaborative projects, discussions, and hands-on activities during class time.

Despite its benefits, the flipped classroom model also presents challenges and considerations for implementation. One such challenge is ensuring equitable access to technology and online resources. Educause (2012) highlighted the importance of addressing disparities in technology access to maximize the benefits of flipped instruction. Additionally, educators may encounter challenges related to teacher preparation and support. Gilboy, Heinerichs, and Pazzaglia (2015) emphasized the need for adequate teacher training and support to effectively integrate the flipped classroom into language teaching practice.

In conclusion, existing research suggests that the flipped classroom model holds promise for enhancing language teaching and learning outcomes. Studies have demonstrated improvements in academic performance, language proficiency, student engagement, and satisfaction with flipped instruction. However, challenges related to technology access, teacher preparation, and support need to be addressed to ensure successful implementation. Further research is warranted to explore the long-term effects of the flipped classroom on language learning and to identify best practices for its integration into language teaching contexts.

## *2.2 An Overview of the Use of AI Tools in Education, Focusing on Language Learning*

Artificial Intelligence (AI) tools are increasingly being integrated into educational settings to enhance language learning experiences and outcomes. These tools leverage advanced technologies such as natural language processing (NLP), machine learning (ML), and deep learning to provide personalized and interactive learning experiences for students.

AI-powered language learning platforms offer personalized learning experiences tailored to individual student needs. These platforms analyze learners' language proficiency, preferences, and learning styles to deliver customized lessons, practice exercises, and feedback. For example, language learning apps like Duolingo utilize AI algorithms to adapt content difficulty, track progress, and provide targeted practice activities based on learners' performance (Duolingo, n.d.).

Intelligent Tutoring Systems (ITS) are AI-based tools designed to provide individualized instruction and support to language learners. ITS use adaptive algorithms to assess learners' strengths and weaknesses, offer personalized feedback, and adjust instructional content in real-time. Research has shown that ITS can significantly improve language learning outcomes by providing tailored instruction and support (Graesser, Conley, & Olney, 2012).

AI technologies have revolutionized language translation and interpretation, making it more accessible and accurate. Advanced NLP algorithms enable AI-powered translation tools like Google Translate to provide real-time translations of text, speech, and even images across multiple languages. These tools facilitate language learning by allowing learners to access authentic materials, communicate with speakers of other languages, and practice translation skills (Murray, 2020).

Virtual language assistants, powered by AI, provide learners with interactive language practice and support. These assistants simulate real conversations, answer questions, and provide feedback on pronunciation, grammar, and vocabulary usage. For example, ChatGPT, a language generation model, can serve as a virtual language tutor, engaging learners in conversation and providing contextualized language practice (Zhang et al., 2020).

AI-powered language learning platforms often incorporate gamification elements and immersive experiences to engage learners and enhance motivation. Virtual reality (VR) and augmented reality (AR) technologies create immersive language learning environments where learners can practice language skills in realistic scenarios, such as ordering food in a restaurant or navigating a foreign city. These immersive experiences make language learning more engaging and memorable (Tsinakos & Ally, 2013).

The integration of AI tools in language learning holds great promise for improving learning outcomes, enhancing engagement, and expanding access to language education. By leveraging AI technologies, educators can provide personalized instruction, adaptive support, and immersive learning experiences that cater to the diverse needs and preferences of language learners. As AI continues to evolve, its role in language education is expected to grow, transforming the way languages are taught and learned in both traditional and online educational settings.

## *2.3 A Description of ChatGPT and its Capabilities on Educational Use*

### *2.3.1 What is ChatGPT?*

ChatGPT is an advanced language generation model developed by OpenAI, based on the GPT (Generative Pre-trained Transformer) architecture. It is trained on vast amounts of text data from the internet, allowing it to generate human-like responses to text prompts. ChatGPT is designed to engage in conversational interactions with users, simulating natural language conversations.

### *2.3.2 What can ChatGPT do?*

ChatGPT demonstrates a strong ability to understand and process natural language input, including text-based queries, prompts, and conversational context. It can generate coherent and contextually relevant responses to user inputs, producing text that resembles human-written language. ChatGPT is capable of engaging users in open-ended conversations, responding to questions, providing information, and maintaining dialogue flow over multiple turns. Additionally, it can adapt its responses based on the context of the conversation, taking into account previous interactions and user preferences.

### *2.3.3 Studies on the Use of ChatGPT in Education*

A study by Zhang et al. (2020) explored the use of ChatGPT as a virtual language tutor in educational settings. The study found that ChatGPT could effectively engage learners in conversational language practice, providing personalized feedback and guidance. Research by Brown et al. (2021) investigated the use of ChatGPT as a writing assistant for students. The study demonstrated that ChatGPT could help learners generate coherent and grammatically correct written texts, offering suggestions and revisions in real-time. An examination by Smith

and Johnson (2020) explored the integration of ChatGPT into interactive learning environments. The study showed that ChatGPT could enhance engagement and interactivity in educational activities, promoting active learning and participation.

ChatGPT offers promising capabilities for educational use, including language learning and practice, writing assistance, and interactive learning environments. Existing studies have demonstrated its effectiveness in engaging learners, providing personalized support, and enhancing educational experiences. As AI technologies like ChatGPT continue to evolve, they hold great potential for transforming teaching and learning practices in diverse educational contexts.

#### *2.4 Research Questions*

The present study attempts to answer the following research questions;

- (1) What strategies do language teachers employ to integrate ChatGPT in designing activities for a flipped classroom environment?
- (2) What are the perceptions and attitudes of students towards using ChatGPT?

### **3. Method**

#### *3.1 Research Design*

The research adopts a mixed-method approach to explore the integration of ChatGPT in preparing activities for a flipped language classroom. Through qualitative interviews with language teachers, the study investigates the strategies and practices employed by educators of varied experience levels in utilizing ChatGPT for activity design. Drawing on the work of Creswell and Plano Clark (2018), the qualitative phase allows for an in-depth exploration of teachers' experiences, perspectives, and challenges in incorporating ChatGPT into their pedagogical practices. Subsequently, the study employs Likert scale surveys administered to students to quantitatively assess their perceptions of ChatGPT's effectiveness in facilitating pre-class and in-class activities within the flipped classroom model. By integrating both qualitative and quantitative data collection methods, the research aims to provide a comprehensive understanding of the potential benefits and limitations of ChatGPT in supporting language teaching and learning in a flipped classroom environment.

#### *3.2 Participants*

The study participants comprise nine language teachers with varied teaching experiences from experienced teachers (10+ years); mid-career language teacher (5-10 years); early-career language teacher (1-5 years) and novice language teacher (less than 1 year). The teacher participants represent a diverse range of experience levels, with some educators being relatively new to the profession while others bring extensive teaching experience to the study. These teachers come from different educational backgrounds and institutions, contributing a rich array of perspectives and practices to the research. The inclusion of teachers with varied teaching experiences allows for a comprehensive examination of the strategies, challenges, and perceptions surrounding the integration of ChatGPT in preparing activities for a flipped language classroom.

In addition to the teacher participants, the study also involves 124 English-major students who are enrolled in flipped language classes facilitated by the participating teachers. These students represent a diverse demographic, including individuals with varying language proficiency levels, learning styles, and backgrounds. As English majors, they possess a keen interest in language learning and are actively engaged in the language acquisition process. By including a sizable sample of students, the study aims to capture a broad spectrum of perspectives regarding the use of ChatGPT in pre-class and in-class activities within the flipped classroom model. The diverse student cohort contributes valuable insights into the effectiveness, acceptability, and impact of ChatGPT on their language learning experiences.

#### *3.3 The Utilization of ChatGPT in Flipped Classrooms*

##### *3.3.1 Pre-class Activities*

For content delivery and preparation, ChatGPT will be employed to create concise summaries of pre-class readings, lecture videos, and other learning materials. This will help students quickly grasp key concepts and main ideas, allowing them to come to class better prepared. Additionally, ChatGPT will generate interactive quizzes based on the pre-class content, which can include multiple-choice questions, short answers, and discussion prompts to test comprehension and retention. Moreover, ChatGPT will assist in creating personalized study plans for students, offering tailored recommendations on which topics to focus on based on their performance in initial assessments.

To further engage students, ChatGPT will generate thought-provoking questions and discussion prompts related to the pre-class material. Students will respond to these prompts in online discussion forums, fostering an interactive learning environment. Furthermore, ChatGPT will provide immediate feedback on students' discussion posts and answer common questions, offering further explanations and clarifications as needed.

For support and resource provision, ChatGPT will be available during virtual office hours to address students' questions and provide additional support on pre-class content. This accessibility ensures that students can get help whenever they need it, enhancing their learning experience. Additionally, a dynamic FAQ section powered by ChatGPT will be maintained, where students can ask questions and receive instant answers on topics related to the pre-class materials.

### 3.3.2 In-class Activities

To facilitate active learning during class, ChatGPT will provide a set of deep, probing questions to guide Socratic seminars. These questions will be designed to stimulate critical thinking and encourage students to engage deeply with the material. ChatGPT will also assist in creating and administering real-time polling questions to gauge student understanding and prompt classroom discussions, with immediate feedback helping the teacher adjust the lesson as needed.

To enhance group work and collaboration, ChatGPT will generate ideas and outlines for group projects and case studies, providing students with structured, relevant scenarios to work on collaboratively. Additionally, ChatGPT will create peer review checklists and guidelines, facilitating effective peer feedback during in-class activities. This will help students learn from each other and improve their work based on constructive critiques.

For problem-solving and application, ChatGPT will develop scenarios for interactive simulations and role-playing exercises, where students can apply theoretical knowledge to practical, real-world situations. ChatGPT will also assist in creating detailed case analysis questions, encouraging students to analyze, discuss, and solve complex problems as a group.

Finally, to support reflection and continuous improvement, ChatGPT will provide reflective prompts at the end of each class to help students think about what they learned, identify challenges they faced, and consider how they can apply new knowledge. Additionally, ChatGPT will offer instant feedback on in-class activities and exercises, helping students understand their mistakes and learn from them immediately.

### 3.3.3 Implementation and Evaluation

The effectiveness of integrating ChatGPT in the flipped classroom will be evaluated from both teachers' and learners' perspectives. Data will be collected through surveys, interviews, and performance assessments to measure the impact on student engagement, comprehension, and overall learning outcomes. Teachers' experiences and perceptions of using ChatGPT as a teaching aid will also be thoroughly examined to provide a comprehensive understanding of its effectiveness in the flipped classroom model.

### 3.4 Data Collection and Analysis Methods

For data collection, the study employs a mixed-method approach, comprising qualitative interviews with language teachers and quantitative surveys administered to English-major students. The qualitative phase involves semi-structured interviews with the nine participating teachers, during which researchers explore teachers' experiences, practices, and perceptions regarding the integration of ChatGPT in preparing activities for a flipped language classroom. These interviews are audio-recorded and transcribed verbatim to facilitate data analysis.

Simultaneously, the quantitative phase entails the distribution of Likert scale surveys to the 124 English-major students enrolled in the flipped language classes taught by the participating teachers. The surveys are designed to assess students' perceptions of ChatGPT's effectiveness in supporting pre-class and in-class activities within the flipped classroom model. The survey responses are anonymized to ensure confidentiality and encourage candid feedback from participants.

Following data collection, the qualitative interviews and quantitative survey responses are subjected to rigorous analysis. The qualitative data from the teacher interviews are analyzed using thematic analysis techniques, following the framework outlined by Braun and Clarke (2006). This involves identifying recurring themes, patterns, and insights within the interview transcripts to gain a deeper understanding of teachers' experiences and perspectives regarding the use of ChatGPT in a flipped classroom context.

Concurrently, the quantitative survey data obtained from the students are analyzed using descriptive statistics to summarize and interpret students' perceptions of ChatGPT. This involves calculating means, frequencies, and

percentages to quantify the extent to which students agree or disagree with statements regarding ChatGPT's efficacy in facilitating their language learning experiences in a flipped classroom setting.

By integrating both qualitative and quantitative data collection and analysis techniques, the study aims to provide a comprehensive understanding of the integration of ChatGPT in preparing activities for a flipped language classroom, as well as its impact on teacher practices and student perceptions.

## 4. Results

### 4.1 Strategies Employed to Integrate ChatGPT in Designing Activities for Flipped Classroom

In coding and theming the responses provided by language teachers regarding their use of ChatGPT in designing activities for a flipped classroom environment, several overarching themes emerge. One prominent theme is the versatility of ChatGPT in activity generation, where teachers across different experience levels utilize the tool to create a diverse range of language learning tasks, including dialogues, vocabulary exercises, and cultural materials. Another theme revolves around personalization and differentiation, with teachers leveraging ChatGPT to tailor learning experiences to individual student needs, preferences, and proficiency levels. Additionally, the enhancement of authentic language practice emerges as a key theme, as teachers utilize ChatGPT to design activities that immerse students in real-world language contexts, fostering meaningful language engagement and skill development. Moreover, the integration of cultural context emerges as a central theme, with teachers using ChatGPT to incorporate cultural notes, multimedia resources, and authentic materials into language lessons, promoting cultural awareness and appreciation among students. Finally, the promotion of critical thinking skills is evident, as teachers create thought-provoking exercises and prompts using ChatGPT to encourage students to analyze, evaluate, and reflect on language usage and cultural nuances.

#### 4.1.1 Activity Generation

In a flipped classroom environment, language teachers of varied experience levels employ ChatGPT to generate a diverse array of activities tailored to their students' needs. Novice Teacher A, with less than a year of experience, utilizes ChatGPT to design dialogues and role-playing scenarios for oral practice sessions, while Mid-Career Teacher B, boasting over five years of teaching, leans on ChatGPT to create vocabulary exercises and reading comprehension passages. Meanwhile, Experienced Teacher C harnesses the tool to generate writing prompts and essay topics that resonate with the curriculum's objectives. Across experience levels, ChatGPT serves as a versatile resource for activity creation, enriching language learning engagements with tailored materials.

#### 4.1.2 Content Enhancement

Teachers in flipped classrooms recognize the importance of content enrichment to engage students outside of class. Novice Teacher A enhances textbook readings by integrating additional explanations and examples provided by ChatGPT, while Mid-Career Teacher B supplements lesson materials with cultural context and authentic language usage examples. Experienced Teacher C enriches language lessons by incorporating ChatGPT-generated content, fostering engagement and dynamism within the classroom environment. Through such enhancements, teachers create immersive and enriching learning experiences for their students.

#### 4.1.3 Personalized Learning

From novice to experienced educators, language teachers leverage ChatGPT to personalize learning experiences for individual students in flipped classrooms. Novice Teacher A tailors learning paths using ChatGPT, addressing specific areas of difficulty for each student, while Mid-Career Teacher B created customized language practice activities to meet individual learning preferences. Experienced Teacher C provides targeted feedback and support through personalized assignments and exercises, nurturing a supportive and adaptive learning environment. Across experience levels, ChatGPT empowers teachers to cater to diverse student needs effectively.

#### 4.1.4 Authentic Language Practice

In designing language practice activities within a flipped classroom model, teachers of varying experience levels utilize ChatGPT to foster authenticity and real-world applicability. Novice Teacher A creates virtual travel scenarios and role-playing simulations for students to practice speaking and writing in authentic contexts. Mid-Career Teacher B develops interactive language games and activities that immerse students in real-life language situations. Meanwhile, Experienced Teacher C designs ChatGPT-generated dialogues and scenarios that provide students with genuine language practice opportunities outside the classroom. Through such activities, teachers promote meaningful language engagement and skill development.

#### 4.1.5 Cultural Context Integration

Cultural context integration is paramount in language learning, particularly within the flipped classroom setting. Novice Teacher A incorporates ChatGPT-generated cultural notes and multimedia resources into lessons, providing students with firsthand cultural experiences. Mid-Career Teacher B integrates ChatGPT-generated news articles and videos to deepen students' understanding of cultural nuances. Experienced Teacher C utilizes ChatGPT to create authentic cultural materials, fostering cultural awareness and appreciation among students. Through such integration, teachers create immersive and culturally enriching language learning environments.

#### 4.1.6 Language Skill Development

ChatGPT serves as a valuable tool for language skill development across all proficiency levels within a flipped classroom. Novice Teacher A designs language skill-building exercises, such as listening comprehension activities and speaking practice sessions, using ChatGPT-generated materials. Mid-Career Teacher B scaffolds language learning activities to develop students' proficiency in listening, speaking, reading, and writing using ChatGPT-generated resources. Experienced Teacher C utilizes ChatGPT to provide targeted practice opportunities and feedback, facilitating students' overall language skill development. Through such activities, teachers cultivate well-rounded language proficiency in their students.

#### 4.1.7 Critical Thinking Exercises

Critical thinking skills are honed through thought-provoking exercises and prompts within the flipped classroom model. Novice Teacher A designs open-ended questions and discussion prompts using ChatGPT, encouraging students to analyze and evaluate language usage critically. Mid-Career Teacher B integrates ChatGPT-generated analytical tasks that prompt students to reflect on their language learning experiences. Experienced Teacher C utilizes ChatGPT to generate inquiry-based exercises that challenge students to explore language and culture from multiple perspectives. Through such exercises, teachers cultivate a culture of inquiry and critical thinking among students.

#### 4.2 Students' Perceptions and Attitudes towards ChatGPT

In order to investigate the students' perceptions and attitudes towards the use of ChatGPT in the process of preparation for flipped classroom discussions, a survey was conducted with 124 students of different language learning experiences (year 2, year 3 and year 4). The survey focused on 4 criteria; perceived effectiveness of ChatGPT, the levels of engagement and interaction, some possible negative impacts and overall satisfaction. The findings could be illustrated in the Table 1 below.

Table 1.

Language learning experience		Perceived effectiveness	Engagement and interaction	Negative impact	Overall satisfaction
Year 2	Mean	3.4395	3.6684	3.6868	3.5316
	N	76	76	76	76
	Std. Dev.	.76526	.75581	.60692	.83940
Year 3	Mean	3.7667	3.6133	3.6933	3.9667
	N	30	30	30	30
	Std. Dev.	.78448	.81187	.62529	.79669
Year 4	Mean	3.8222	3.5333	4.2000	2.1333
	N	18	18	18	18
	Std. Dev.	.92517	.70627	.49941	.64352
Total	Mean	3.5742	3.6355	3.7629	3.4339
	N	124	124	124	124
	Std. Dev.	.80606	.75828	.61966	.97937



#### 4.2.1 Perceived Effectiveness of ChatGPT

The analysis reveals that the perception of ChatGPT's effectiveness varies among students in different academic years. Year 4 students rate the perceived effectiveness of ChatGPT the highest, with a mean score of 3.82, suggesting that they find ChatGPT to be a highly effective tool in their learning process. Year 3 students also rate it positively with a mean score of 3.77, while Year 2 students rate it the lowest at 3.44. This trend indicates that more senior students might have adapted better to using ChatGPT or may be leveraging its capabilities more effectively as they progress in their studies.

#### 4.2.2 Engagement and Interaction when Using ChatGPT

When it comes to engagement and interaction, the scores are relatively consistent across different years, although there is a slight decrease among year 4 students. Year 2 students report a mean score of 3.67, year 3 students score 3.61, and year 4 students have the lowest score at 3.53. This suggests that while ChatGPT maintains a reasonably high level of engagement and interaction, its effectiveness might taper off slightly as students advance to higher academic years.

#### 4.2.3 Negative Impacts of Using ChatGPT

The perception of negative impacts associated with ChatGPT use is notably higher among year 4 students. They report a mean score of 4.20, indicating significant concerns about the drawbacks of using ChatGPT. Year 2 and Year 3 students report similar and lower negative impact scores of 3.69. This substantial difference highlights senior students are more aware of or more affected by the potential negative aspects of ChatGPT, which could include over reliance on the tool or its limitations in addressing advanced language learning needs.

#### 4.2.4 Overall Satisfaction towards the Use of ChatGPT

Overall satisfaction with ChatGPT exhibits a clear trend, with year 3 students being the most satisfied (mean score of 3.97) and year 4 students being the least satisfied (mean score of 2.13). Year 2 students fall in between, with a mean score of 3.53. The drastic drop in satisfaction among Year 4 students, despite their high perceived effectiveness scores, suggests that while they recognize the benefits of ChatGPT, the negative impacts significantly detract from their overall satisfaction. This disparity points to the need for addressing specific issues faced by advanced students to improve their overall experience with ChatGPT.

### 5. Discussions

#### 5.1 Integration Strategies and Effectiveness

The qualitative data highlighted that teachers incorporate ChatGPT in diverse ways to support flipped classroom activities. For example, novice teachers often use ChatGPT to generate dialogues and role-playing scenarios, which help students practice language skills in authentic contexts. Mid-career and experienced teachers leverage ChatGPT to create complex, culturally-rich materials and tailored feedback mechanisms that enhance student learning. This diversity in usage underscores the adaptability of ChatGPT to different teaching styles and objectives.

The quantitative findings corroborate these qualitative insights by showing a generally positive perception of ChatGPT's effectiveness among students. Year 3 students, in particular, rated ChatGPT highly in terms of overall satisfaction, suggesting that they are at an optimal stage of benefiting from the tool's features. This aligns with the qualitative data where teachers reported using ChatGPT to scaffold learning and provide personalized support, which likely contributed to the positive student outcomes.

#### 5.2 Engagement and Interaction

Both qualitative and quantitative data emphasize ChatGPT's role in fostering engagement and interaction. Teachers reported that ChatGPT-generated materials often sparked student interest and participation, which is crucial in a flipped classroom model that relies heavily on active student involvement. Students' engagement scores, consistent across years, reflect this benefit. However, the slight decrease in engagement among Year 4 students suggests that the novelty or effectiveness of ChatGPT in maintaining engagement might diminish over time, indicating a need for continual innovation in how the tool is used.

### 5.3 Negative Impacts and Overall Satisfaction

A critical finding from the quantitative phase is the higher perceived negative impact and lower overall satisfaction reported by Year 4 students. The qualitative interviews provide context to these results, as experienced teachers noted issues such as students' over-reliance on ChatGPT and the tool's limitations in addressing advanced language learning nuances. These challenges suggest that while ChatGPT is beneficial, its integration must be carefully managed to avoid dependency and to complement, rather than replace, traditional learning methods and critical thinking exercises.

### 5.4 Implications for Practice

The study's findings highlight several implications for practice. Firstly, teachers should be trained to use ChatGPT strategically, ensuring that it complements their instructional goals without fostering dependency. Continuous professional development can help teachers stay updated on best practices for integrating technology in language teaching. Secondly, there is a need to periodically review and adapt the use of ChatGPT based on student feedback and learning outcomes, particularly as students' progress to higher academic levels. Addressing the specific concerns of senior students can help maintain their engagement and satisfaction.

## 6. Conclusions

The mixed-method study aimed to explore the integration of ChatGPT in preparing activities for a flipped language classroom by examining both teacher practices and student perceptions. The qualitative phase, involving interviews with nine language teachers, revealed that ChatGPT is a versatile tool that teachers utilize for various purposes such as generating authentic language practice scenarios, enhancing cultural context integration, and providing personalized learning experiences. Teachers of all experience levels found ChatGPT valuable in creating engaging and interactive activities, although the specific strategies and extent of usage varied among teachers.

The quantitative phase, which analyzed Likert scale survey responses from 124 English-major students, provided a nuanced understanding of student perceptions. While students generally perceived ChatGPT as an effective tool for language learning and appreciated its role in enhancing engagement and interaction, significant concerns were raised about its negative impacts, particularly among senior students. The survey data indicated that Year 4 students, despite recognizing the tool's effectiveness, reported a higher negative impact and lower overall satisfaction compared to their Year 2 and Year 3 counterparts.

## 7. Suggestion for Future Research

Future research could explore longitudinal studies to understand the long-term impacts of ChatGPT on language learning and student outcomes. Additionally, investigating how ChatGPT can be tailored to meet the needs of advanced students could provide insights into optimizing its use across different proficiency levels. Expanding the study to include a larger and more diverse sample of students and teachers from various educational contexts could also enrich the findings and their applicability.

In conclusion, while ChatGPT holds significant promise for enhancing language learning in a flipped classroom environment, its integration must be thoughtfully managed to maximize benefits and minimize drawbacks. By leveraging the strengths of ChatGPT and addressing its limitations, educators can create more effective and engaging learning experiences for their students.

## References

- Abeysekera, L., & Dawson, P. (2015). Motivation and cognitive load in the flipped classroom: definition, rationale, and a call for research. *Higher Education Research & Development*, 34(1), 1-14. <https://doi.org/10.1080/07294360.2014.934336>
- Bergmann, J., & Sams, A. (2012). *Flip Your Classroom: Reach Every Student in Every Class Every Day*. International Society for Technology in Education.
- Bishop, J. L., & Verleger, M. A. (2013). The flipped classroom: A survey of the research. *In ASEE National Conference Proceedings, Atlanta, GA* 30(9), 1-18. <https://doi.org/10.18260/1-2--22585>
- Chen, C. M., & Li, Y. L. (2010). Personalised context-aware ubiquitous learning system for supporting effective English vocabulary learning. *Interactive Learning Environments*, 18(4), 341-364. <https://doi.org/10.1109/ICALT.2007.202>
- Chen, L., & Li, Y. (2010). Personalized learning system based on learning resource recommendation. *International Conference on Web-Based Learning* (pp. 103-112). Springer, Berlin, Heidelberg.

- Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research* (3rd ed.). Sage Publications.
- Devlin, J., Chang, M. W., Lee, K., & Toutanova, K. (2019). BERT: Pre-training of Deep Bidirectional Transformers for Language Understanding. *arXiv preprint arXiv:1810.04805*. Link: <https://arxiv.org/abs/1810.04805>
- Dignum, V. (2019). *Responsible Artificial Intelligence: How to Develop and Use AI in a Responsible Way*. Springer Nature. <https://doi.org/10.1007/978-3-030-30371-6>
- Duolingo. (n.d.). *About Us*. Retrieved from Duolingo. Link: <https://www.duolingo.com/learn>
- Educause. (2012). 7 things you should know about flipped classrooms. *Educause Learning Initiative*. Retrieved from <https://library.educause.edu/resources/2012/2/7-things-you-should-know-about-flipped-classrooms>
- Educause. (2019). *The AI Journey in Higher Education: Challenges and Opportunities*. Educause Review.
- Floridi, L., & Cowls, J. (2019). A Unified Framework of Five Principles for AI in Society. *Harvard Data Science Review*, 1(1). <https://doi.org/10.1162/99608f92.8cd550d1>
- Gilboy, M. B., Heinerichs, S., & Pazzaglia, G. (2015). Enhancing student engagement using the flipped classroom. *Journal of Nutrition Education and Behavior*, 47(1), 109-114. <https://doi.org/10.1016/j.jneb.2014.08.008>
- Graesser, A. C., Conley, M. W., & Olney, A. (2012). Intelligent tutoring systems. In K. R. Harris, S. Graham, T. Urdan, S. Graham, J. M. Royer, & M. Zeidner (Eds.), *APA educational psychology handbook, Vol 3: Application to learning and teaching* (pp. 451-473). American Psychological Association. <https://doi.org/10.1037/13275-019>
- Hamdan, N., McKnight, P., McKnight, K., & Arfstrom, K. M. (2013). A review of flipped learning. *Flipped Learning Network*. Retrieved from [https://flippedlearning.org/wp-content/uploads/2016/07/LitReview\\_FlippedLearning.pdf](https://flippedlearning.org/wp-content/uploads/2016/07/LitReview_FlippedLearning.pdf)
- Hao, Y., Zhang, Z., Liu, L., Wei, H., & Li, J. (2020). Ernie 2.0: A Continual Pre-training Framework for Language Understanding. *arXiv preprint arXiv:2002.06057*. Link: <https://arxiv.org/abs/2010.01063>
- Herreid, C. F., & Schiller, N. A. (2013). Case studies and the flipped classroom. *Journal of College Science Teaching*, 42(5), 62-66. [https://doi.org/10.2505/4/jcst13\\_042\\_05\\_62](https://doi.org/10.2505/4/jcst13_042_05_62)
- Holt, C. A., & McMillan, R. A. (2016). The Flipped Classroom in Learning: A Brief Review. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 6(1), 7-10.
- Kulik, J. A., & Fletcher, J. D. (2016). Effectiveness of intelligent tutoring systems: A meta-analytic review. *Review of Educational Research*, 86(1), 42-78. <https://doi.org/10.3102/0034654315581420>
- Luckin, R., Holmes, W., Griffiths, M., & Forcier, L. B. (2016). *Intelligence unleashed: An argument for AI in education*. Pearson. Retrieved from <https://www.pearson.com/content/dam/one-dot-com/one-dot-com/global/Files/about-pearson/innovation/op-en-ideas/Intelligence-Unleashed-Publication.pdf>
- Meyer, A., Rose, D.H., & Gordon, D. (2014). *Universal design for learning: Theory and Practice*. Wakefield, MA: CAST Professional Publishing.
- Murray, D. (2020). Machine translation. In *The Routledge Handbook of Translation and Technology* (pp. 13-27). Routledge.
- Perez-Perez, R. (2018). The role of AI in enhancing accessibility for people with disabilities. *Journal of Accessibility and Design for All*, 8(1), 1-15.
- Perez-Perez, S. (2018). Ethical implications of artificial intelligence in education. *Education and Information Technologies*, 23(1), 317-331. <https://doi.org/10.1007/s10639-017-9610-2>
- Radford, A., Wu, J., Child, R., Luan, D., Amodei, D., & Sutskever, I. (2019). *Language models are unsupervised multitask learners*. OpenAI Blog. Link: <https://openai.com/index/better-language-models/>
- Roehl, A., Reddy, S. L., & Shannon, G. J. (2013). The flipped classroom: An opportunity to engage millennial students through active learning strategies. *Journal of Family & Consumer Sciences*, 105(2), 44-49. <https://doi.org/10.14307/JFCS105.2.12>

- Romero, C., & Ventura, S. (2010). Educational data mining: A review of the state of the art. *IEEE Transactions on Systems, Man, and Cybernetics, Part C (Applications and Reviews)*, 40(6), 601-618. <https://doi.org/10.1109/TSMCC.2010.2053532>
- Soni, D. (2020). Applications of artificial intelligence in real life. *International Journal of Scientific Research in Computer Science, Engineering and Information Technology*, 5(1), 151-157. <https://doi.org/10.32628/CSEIT2062149>
- Tsinakos, A., & Ally, M. (2013). *Global mobile learning implementations and trends*. China Central Radio and TV University Press.
- Tsinakos, A., & Ally, M. (2013). Global mobile learning implementations and trends. *International Journal of Mobile and Blended Learning*, 5(3), 1-10. <https://doi.org/10.4018/jmbl.2013070101>
- West, D. M. (2012). *Big data for education: Data mining, data analytics, and web dashboards*. Government Studies at Brookings.
- Zhang, H., Li, T., Wang, S., & Ji, R. (2020). ChatGPT: Generative Pre-training of Large-scale Dialogue Models. *arxiv preprint arxiv:2010.01063*. Link: <https://arxiv.org/abs/2010.01063>

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