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Using Twee an Artificial Intelligence Tool to Enhance the Teaching-Learning Process in English as a Foreign Language (EFL) Education

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DEDICATION

Filled with affection, love, and hope, I dedicate this project to each of my loved ones who have been my fundamental pillars to keep moving forward.

It is a great satisfaction for me to be able to dedicate this to them, as I have earned it with effort and honest work.

To my parents, Wellington Beltrán and Mariana Moreno, to my daughter, Emilia Beltrán, and to my girlfriend, Andrea Vilela, because they are the motivation and pride of my life.

Finally, I express my gratitude to Carmen Letamendi, my tutor, which have been beyond patient and collaborative, which is why we have succeeded in this academic journey.

With all my gratitude,

Miguel Beltran

Using Twee an Artificial Intelligence Tool to Enhance the Teaching-Learning Process in English as a Foreign Language (EFL) Education

Abstract

This study explores the use of Twee, an artificial intelligence (AI) tool, to enhance the teaching-learning process in English as a Foreign Language (EFL) education. Conducted with 23 EFL teachers from the Language Center (CENID) at the Universidad Técnica de Babahoyo, the study aimed to assess how AI integration affects teacher practices, collaboration, and engagement in the classroom. A three-day training session was conducted to familiarize the teachers with Twee, and qualitative data was collected through surveys and interviews. The results show that teachers experienced significant improvements in their teaching strategies, increased collaboration with peers, and greater confidence in utilizing AI tools. However, challenges related to technological reliability and the need for continued professional development were also identified. The study concludes with recommendations for expanding AI literacy among teachers, developing stronger support systems for technology integration, and promoting future research to assess the long-term impact of AI on student outcomes.

Keywords: Artificial Inteligence, Colaborative Teaching, Twee, Tools.

Resumen

Este estudio explora el uso de Twee, una herramienta de inteligencia artificial (IA), para mejorar el proceso de enseñanza-aprendizaje en la educación de Inglés como Lengua Extranjera (EFL). Realizado con 23 profesores de EFL del Centro de Idiomas (CENID) en la Universidad Técnica de Babahoyo, el estudio tuvo como objetivo evaluar cómo la integración de IA afecta las prácticas docentes, la colaboración y el compromiso en el aula. Se llevó a cabo una sesión de capacitación de tres días para familiarizar a los docentes con Twee, y se recopilaron datos cualitativos a través de encuestas y entrevistas. Los resultados muestran que los profesores experimentaron mejoras significativas en sus estrategias de enseñanza, mayor colaboración con sus colegas y mayor confianza en el uso de herramientas de IA. Sin embargo, también se identificaron desafíos relacionados con la fiabilidad tecnológica y la necesidad de desarrollo profesional continuo. El estudio concluye con recomendaciones para ampliar la alfabetización en IA entre los docentes, desarrollar sistemas de apoyo para la integración tecnológica y promover futuras investigaciones para evaluar el impacto a largo plazo de la IA en los resultados de los estudiantes.

Palabras claves: Inteligencia Artificial, Enseñanza Colaborativa, Twee, Herramientas.

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Introduction

Technology advancements have transformed the education landscape, offering innovative tools to enhance both teaching and learning processes. One such tool is Twee, an artificial intelligence (AI) platform designed to support educators' instructional strategies (Celik, 2023). As English as a Foreign Language (EFL) education continues to grow in importance globally, the integration of AI-driven tools like Twee presents an opportunity to change traditional pedagogical approaches, making them more effective and adaptive to the needs of diverse learners (Hichour, 2022).

This study, conducted at the Universidad Técnica de Babahoyo, focuses on exploring the impact of Twee on the teaching-learning process within the context of EFL education. The research involves a cohort of 25 EFL teachers from the Language Center (CENID), who will integrate Twee into their instructional practices. The primary aim is to determine how this AI tool can improve the effectiveness of language instruction and lead to better learning outcomes.

EFL education presents some challenges mostly in non-native English-speaking regions where access to resources and exposure to the language may be limited (T. Kumar et al., 2023). Traditional teaching methods often struggle to meet the needs of learners, who may differ in their language proficiency. In this context, Twee offers a solution by providing personalized learning experiences, adaptive feedback, and data-driven insights that can help teachers improve their instruction (Boutheyna, 2021).

In many non-native English-speaking regions, including Ecuador, the process of teaching English as a Foreign Language (EFL) faces significant challenges. Traditional methods of instruction often rely on a one-size-fits-all approach that fails to address the diverse needs of learners. EFL students come from varied linguistic backgrounds, possess differing levels of language proficiency, and have unique learning preferences (Chun et al., 2016).

These factors make it difficult for educators to deliver instruction that is both effective and engaging. Additionally, the lack of exposure to authentic English language contexts further complicates the acquisition of language skills (De Costa & Norton, 2016). In this challenging environment, teachers often struggle to provide the personalized attention necessary to support each student's learning journey.

The primary problem addressed in this research is the inadequacy of traditional EFL teaching methods to meet the diverse needs of learners in non-native English-speaking contexts. Specifically, the research seeks to investigate how the integration of Twee, an artificial intelligence tool, can enhance the teaching-learning process in EFL education. The study aims to determine whether the use of Twee can address the limitations of conventional instructional strategies by providing personalized learning experiences, adaptive feedback, and data-driven insights that support more effective language acquisition. Then the question that guide this study is: How does the implementation of Twee, an AI-driven tool, impact the teaching-learning process in English as a Foreign Language (EFL) education at Universidad Técnica de Babahoyo?

On the other hand, this research is justified by the growing need to modernize EFL education in non-native English-speaking regions, where traditional teaching methods often fall short in addressing the diverse learning needs of students. The integration of artificial intelligence tools like Twee presents a significant opportunity to revolutionize language instruction. By using AI tools, educators can provide personalized learning experiences that are better for individual needs of each student, thereby enhancing their engagement and improving learning outcomes.

Furthermore, the use of AI-driven tools can empower teachers with data-driven insights that enable more informed instructional decisions, ultimately leading to more effective teaching practices. Conducting this research at the Universidad Técnica de Babahoyo is particularly relevant, as it aligns with the institution's commitment to embracing technological innovations in education. The findings of this study have the potential to inform future pedagogical practices and contribute to the broader discourse on the role of AI in education, making it a valuable contribution to the field of EFL education.

The chosen thesis topic aligns closely with the research lines of the Universidad Bolivariana del Ecuador, particularly in the areas of innovative pedagogical strategies and technology-enhanced learning. This proposal reflects the university's commitment to advancing educational practices and promoting a dynamic learning environment through the integration of technological tools.

At the core of this research is an exploration of the relationship between artificial intelligence (AI) and pedagogical methodologies, specifically within the context of English as a Foreign Language (EFL) education. The study's focus on the implementation of Twee, an AI-driven tool, addresses the university's research emphasis on leveraging technology to enhance educational outcomes. This research also addresses a pressing concern in modern education: how to optimize the teaching-learning process in EFL classrooms through the effective use of AI tools while maintaining the central role of educators. This aligns with the university's commitment to empowering teachers and enhancing their instructional capabilities.

Moreover, the emphasis on providing practical recommendations for educators ensures that the research findings are directly applicable to improving teaching practices. This aligns with the university's dedication to translating research insights into tangible improvements in education, particularly in the strategic integration of AI tools in EFL classrooms to enhance student engagement and learning outcomes.

Research aim

To evaluate the effectiveness of Twee as an AI tool in enhancing the teaching-learning process in EFL education at Universidad Técnica de Babahoyo.

Specific research objectives

1. To analyze how Twee influences the instructional practices of EFL teachers at Universidad Técnica de Babahoyo.

2. To identify the challenges and opportunities associated with integrating Twee into EFL teaching practices.

3. To provide practical recommendations for optimizing the use of AI tools like Twee in EFL education.

Then, analyzing the operationalization of the variables involved in the study, the independent variable in this study is the use of Twee, an AI-driven tool designed to enhance the EFL teaching-learning process. Conceptually, Twee is seen as a new educational technology that can personalize learning experiences, by creating activities which are authentic. Operationally, this involves its integration into the instructional practices of EFL teachers at Universidad Técnica de Babahoyo, including how frequently it is used, how it is utilized, and the type of feedback it generates.

The dependent variables are categorized into three main areas: teaching practices, student learning outcomes, and integration challenges and opportunities. Conceptually, teaching practices refer to the methods and strategies employed by teachers to facilitate language learning. Operationally, this involves any observable changes in how teachers manage classrooms, interact with students, and adapt instructional strategies after integrating Twee. Finally, Student learning outcomes conceptually refer to the effectiveness of EFL education as evidenced by student performance and engagement. Operationally, this will be measured through student assessments, engagement levels, and improvements in language proficiency.

For this reason, this research will employ a mixed-methods approach, combining both qualitative and quantitative methodologies to comprehensively address the research objectives. The qualitative component will involve semi-structured interviews with a subset of 8 EFL teachers to gather in-depth insights into their experiences and perceptions of using Twee. This will help identify any challenges, opportunities, and changes in teaching practices.

The quantitative component will include a survey administered to all 25 EFL teachers at Universidad Técnica de Babahoyo, focusing on the frequency of Twee's use, its perceived effectiveness, and the impact on student learning outcomes. Descriptive statistics will be used to analyze survey data, allowing for a broader understanding of how Twee influences teaching and learning.

The research will also include classroom observations to directly assess the implementation of Twee in the instructional environment, and to correlate these observations with survey and interview findings. This triangulation of data sources ensures a robust analysis that captures the complexities of integrating AI tools into EFL education. The research will utilize those primary instruments:

- Interview for Initial Diagnosis: A semi-structured interview will be conducted with 8 selected EFL teachers to gain a deeper understanding of their initial reactions, experiences, and expectations regarding the use of Twee. The interview will explore their perceptions of the tool’s usefulness, any challenges they foresee or have encountered, and how they believe Twee could potentially enhance their teaching practices.

- Survey for Descriptive Statistics: A structured survey will be administered to all 25 EFL teachers. The survey will include Likert-scale questions to quantify teachers' usage of Twee, their satisfaction with the tool, perceived impacts on student learning, and any challenges faced during implementation. The survey results will provide quantifiable data that can be analyzed to identify trends and correlations.

This research has the potential to significantly benefit 26 English teachers and approximately 6,000 students at the Universidad Técnica de Babahoyo. The participating English teachers will gain important insights into the effective use of Twee in virtual English classrooms. By exploring the capabilities of the tool, those teachers can refine their teaching practices, leading to more engaging and personalized learning experiences for their students. Furthermore, the outcomes of this research will have a direct impact on the students enrolled in English courses at the university, ranging from A1 to B1 levels according to the CEFR. These students will benefit from innovative teaching methodologies, interactive content, and customized learning experiences made possible by the strategic application of this AI tool in their education.

This proposal offers practical contributions that are both significant and timely, particularly in the context of modern education. One of the key contributions is the enhancement of teaching practices through the integration of AI tools like Twee in EFL education. This is important because it directly addresses the challenges faced by educators in meeting the diverse needs of students in virtual classrooms. By providing personalized learning experiences and adaptive feedback,

AI tools can help bridge the gap between traditional teaching methods and the dynamic needs of today's learners, leading to improved educational outcomes.

The importance of this research extends beyond the immediate educational context, as it has the potential to influence broader pedagogical practices. By demonstrating the effectiveness of AI-driven tools in enhancing the teaching-learning process, this study can inspire other educational institutions to adopt similar technologies, thereby contributing to the ongoing evolution of education in the digital age.

Furthermore, the social need for this research is underscored by the increasing reliance on virtual learning environments, especially in regions where access to quality education is limited. By equipping teachers with the tools and knowledge to effectively integrate AI into their teaching, this research addresses a critical need for innovative solutions that can make education more accessible, engaging, and effective for all learners.

In the following sections, this research will explore some theoretical framework underpinning the use of AI in education, review existing literature on AI in EFL teaching, and outline the methodology used to assess the effectiveness of Twee at CENID. The study will then present its findings, discuss their implications, and offer recommendations for educators and policymakers seeking to integrate AI tools into their instructional practices.

Chapter 1: Literature Review

Artificial Intelligence (AI) has rapidly appeared as a force in the field of education, reshaping traditional pedagogical approaches and enhancing both teaching and learning experiences. The integration of AI technologies into educational settings offers unprecedented opportunities for personalization, efficiency, and accessibility.

1.1.Review of AI Tools in EFL Education

The integration of AI in English as a Foreign Language (EFL) education has led to the development of a variety of tools designed to enhance language learning through technology (Lu, 2019). This section provides a comprehensive review of existing AI tools, with a particular focus on their application in EFL contexts. By examining these tools, educators and researchers can gain insights into how AI can be leveraged to improve language instruction and learning outcomes. The review culminates with an in-depth exploration of Twee, an AI tool specifically designed for educational purposes, highlighting its unique features and its potential impact on EFL education.

1.1.1. Overview of Existing AI Tools for Language Learning

AI tools have increasingly become integral to language learning, offering innovative ways to facilitate language acquisition, practice, and assessment. Prominent AI tools in EFL education include chatbots, which simulate conversation with a native speaker; Natural Language Processing (NLP) tools, which analyze and provide feedback on learner language use; and adaptive learning platforms,

which tailor content to individual learner needs. Chatbots, such as Replika and Duolingo's conversation bot, engage learners in simulated dialogues, providing a risk-free environment to practice speaking skills (Lindner et al., 2019). NLP tools like Grammarly and Write & Improve offer automated feedback on writing, helping learners to refine their grammar, vocabulary, and style. Additionally, platforms like Rosetta Stone and Mondly use AI to adapt lessons based on the learner's progress, ensuring that the content remains appropriately challenging and engaging.

When comparing these AI tools, several factors emerge that influence their efficacy and the level of user engagement they generate. Chatbots, for instance, are highly effective in promoting speaking practice and conversational fluency, but their interactions can sometimes feel artificial, limiting the depth of engagement (L. Chen et al., 2020). NLP tools excel in providing immediate, specific feedback on writing, which is important for developing accuracy in language use, but they may lack the significant understanding of context that a human teacher can provide.

Adaptive learning platforms are particularly effective in personalizing the learning experience, thereby maintaining high levels of learner motivation and engagement. However, their reliance on algorithm-driven content delivery can sometimes lead to a less holistic approach to language learning, where the emphasis is on rote learning rather than communicative competence (Al Braiki et al., 2020). Overall, while each tool has its strengths, their efficacy and engagement levels vary depending on the specific learning context and the needs of the learners.

1.1.2. Twee as an AI Tool

Twee stands out among AI tools for its comprehensive approach to enhancing the teaching-learning process in EFL education. Designed with the needs of both teachers and students in mind, Twee offers a suite of features that support various aspects of language learning. Its core functionalities include adaptive learning modules that adjust to the learner's proficiency level, interactive exercises that promote active language use, and real-time feedback mechanisms that help learners identify and correct errors immediately(Ibna et al., 2021).

Additionally, Twee incorporates AI-driven analytics that provide educators with detailed insights into student performance, enabling them to tailor instruction to address specific learning gaps. The platform also includes collaborative tools that facilitate peer-to-peer interaction, promoting a sense of community and encouraging the social aspects of language learning. Overall, Twee’s features are designed to create a balanced, engaging, and personalized learning experience that supports the development of all language skills—listening, speaking, reading, and writing (Chen & Liu, 2023).

1.1.2.1. Case Studies or Pilot Studies Using Twee in Language Education

The effectiveness of Twee as an AI tool in language education has been demonstrated through several case studies and pilot studies conducted in diverse educational settings. A case study from a secondary school in Iraq highlighted how Twee's adaptive learning modules helped students with varying proficiency levels make substantial progress in their English language skills over a single academic

term. These studies underscore Twee's potential to enhance EFL education by providing both learners and educators with powerful tools to support language development (Nesrallah & Zangana, 2020).

1.1.2.2. Strengths and Limitations of Twee Compared to Other AI Tools

While Twee offers many advantages, particularly in its ability to provide personalized and adaptive learning experiences, it is not without its limitations. One of Twee's key strengths is its comprehensive analytics, which offer educators actionable insights that can inform instructional decisions. This level of data-driven support is something that many other AI tools, which may focus more narrowly on specific language skills, do not provide (Wulandari & Purnamaningwulan, 2024).

Additionally, Twee's collaborative features set it apart from other tools that may primarily focus on individual learning. However, like other AI tools, Twee also faces challenges related to its reliance on algorithms, which may not always account for the refines of human interaction or the complexity of language use in real-world contexts (Williyan et al., 2024). Moreover, the effectiveness of Twee is partly contingent on the digital literacy of both teachers and students; those who are less comfortable with technology may not fully leverage the platform's capabilities. Despite these limitations, Twee represents a significant advancement in AI tools for EFL education, offering a robust, versatile solution that can be adapted to various educational contexts (Matveeva, 2023).

1.2. Introduction to AI Education

AI can support to individual student needs, automate administrative tasks, and provide real-time feedback, thereby enabling educators to focus more on instructional quality and student engagement. This introduction sets the stage for a comprehensive exploration of how AI, specifically through tools like Twee, can revolutionize English as a Foreign Language (EFL) education by addressing existing challenges and promoting a more dynamic and effective learning environment.

1.2.1. Overview of AI Technologies in Education

AI in education refers to the application of artificial intelligence technologies to facilitate and enhance various aspects of the educational process. This encompasses a wide range of tools and systems, including intelligent tutoring systems, adaptive learning platforms, automated grading systems, and virtual assistants. The scope of AI in education extends beyond mere automation; it involves the creation of intelligent environments that can adapt to individual learner needs, provide personalized content, and support diverse learning styles (Bharadiya, 2022). By integrating AI, educational institutions can offer more tailored and effective learning experiences, ultimately improving student outcomes and promoting lifelong learning skills.

The journey of AI in education began with rudimentary computer-assisted instruction systems in the mid-20th century, which primarily focused on drill-and-practice exercises. Over the decades, advancements in AI have led to the

development of more sophisticated tools capable of mimicking human cognitive processes. The 1980s and 1990s saw the emergence of intelligent tutoring systems that could provide personalized instruction and feedback (L. Chen et al., 2020). With the advent of the internet and the proliferation of digital technologies in the 21st century, AI tools have become more accessible and versatile, incorporating features such as natural language processing, predictive analytics, and machine learning algorithms. Today, AI-driven educational technologies are integral to modern classrooms, supporting both in-person and virtual learning environments with enhanced interactivity and adaptability (Z. Wang, 2022).

Several AI tools have gained prominence in educational settings due to their ability to enhance learning and teaching processes. Intelligent tutoring systems like Carnegie Learning provide personalized instruction and real-time feedback to students. Adaptive learning platforms such as Knewton and DreamBox adjust the difficulty and type of content based on individual student performance and learning pace (Al Braiki et al., 2020). Virtual assistants like IBM's Watson Education and chatbots offer on-demand support and answer student queries, facilitating a more interactive learning experience. Additionally, AI-powered analytics tools enable educators to monitor student progress, identify learning gaps, and make data-driven decisions to improve instructional strategies (Jiang, 2022).

1.2.2. AI in Language Learning

AI plays an important role in language acquisition by providing personalized and interactive learning experiences that cater to the unique needs of

each learner. Through natural language processing and machine learning, AI tools can analyze a learner's proficiency, identify areas for improvement, and deliver targeted exercises to enhance vocabulary, grammar, pronunciation, and conversational skills (Jiang, 2022).

For instance, AI-driven applications like Duolingo and Babbel utilize adaptive algorithms to tailor lessons based on the learner's progress and performance, ensuring that the instruction remains relevant and challenging. Furthermore, AI can facilitate immersive language environments through virtual reality and augmented reality, enabling learners to practice language skills in realistic contexts and engage in meaningful communication with virtual interlocutors (Enholm et al., 2022).

Traditional language learning methods often rely on standardized curricula, limited interaction, and one-size-fits-all instructional approaches, which may not effectively address the diverse needs and learning paces of individual students. In contrast, AI-enhanced language learning methods offer a more personalized and flexible approach. AI tools can continuously assess learner performance and adapt the difficulty and type of content in real-time, providing a customized learning path that accommodates different learning styles and speeds (Sumakul et al., 2022).

Additionally, AI facilitates greater interactivity and engagement through multimedia content, interactive exercises, and instant feedback, which can enhance motivation and retention. While traditional methods emphasize face-to-face instruction and human interaction, AI-enhanced methods leverage technology to

provide scalable and accessible learning opportunities that can complement and extend traditional pedagogical practices (Hwang et al., 2020).

The integration of AI in language education presents numerous benefits, including personalized learning experiences, increased accessibility, and enhanced engagement. AI tools can support individual learner needs, allowing for a more tailored and effective learning process. They also provide opportunities for learners to practice language skills anytime and anywhere, breaking down geographical and temporal barriers. Furthermore, AI-driven feedback and analytics can help educators identify and address learning gaps more efficiently (Hwang et al., 2020).

However, the integration of AI also poses several challenges. These include concerns about data privacy and security, the potential for reduced human interaction and the significant understanding that human teachers provide, and the need for significant investment in technology and training. Additionally, there may be resistance to change among educators and institutions, as well as challenges related to ensuring the equity of access to AI-enhanced educational tools for all students (Sestino & De Mauro, 2022).

1.2.3. AI in the International Context

Globally, AI is increasingly being recognized as a pivotal element in the modernization of education systems. Countries around the world are investing in AI technologies to enhance their educational infrastructures, aiming to improve student outcomes, increase educational equity, and prepare learners for a technologically advanced workforce. International initiatives, such as United

Nations Educational, Scientific and Cultural organization (UNESCO) AI in Education framework, highlight the potential of AI to support personalized learning, automate administrative tasks, and provide real-time insights into student performance (Z. Wang et al., 2022).

In developed nations, AI tools are being integrated into mainstream educational practices, while developing countries are exploring AI as a means to bridge educational gaps and provide access to quality education in underserved regions. The international adoption of AI in education underscores a global shift towards data-driven, technology-enhanced learning environments that prioritize adaptability, inclusivity, and continuous improvement in educational practices (Wang et al., 2022).

1.2.4. AI in the Ecuadorian Context

In Ecuador, the adoption of AI in education is gaining momentum as institutions seek to enhance teaching and learning processes amidst evolving educational demands. "Universidad Técnica de Babahoyo" exemplifies this trend by integrating AI tools like Twee into its EFL programs, aiming to address the specific challenges faced by non-native English speakers in a diverse and resource-constrained environment. Ecuadorian educational policies are increasingly supportive of technological innovation, recognizing the potential of AI to improve educational outcomes and expand access to quality education across the country (Toapanta et al., 2022).

However, the implementation of AI in Ecuadorian education also faces unique challenges, including limited technological infrastructure, disparities in access to digital resources, and the need for comprehensive teacher training programs to effectively utilize AI tools. Despite these obstacles, the use of AI in EFL education at institutions like Universidad Técnica de Babahoyo highlights a commitment to leveraging technology to enhance language acquisition, promote inclusive education, and prepare students for global competitiveness in an increasingly interconnected world (Conde-Zhingre et al., 2022).

1.3. Theoretical Frameworks in EFL Education

The application of AI in English as a Foreign Language (EFL) education is not just a technological innovation; it is deeply rooted in established educational theories that guide the design and implementation of AI-driven tools. These theoretical frameworks provide a foundation for understanding how AI can enhance the teaching-learning process, particularly in the context of language acquisition. The integration of AI in EFL education is supported by theories such as constructivism, cognitive load theory, and sociocultural theory, each of which offers valuable insights into how AI can create more effective, personalized, and socially interactive learning environments.

1.3.1. Constructivism

Constructivism posits that learners construct knowledge through active engagement with content, rather than passively receiving information. AI supports constructivist learning environments by creating dynamic, interactive platforms

where learners can explore language concepts, experiment with language use, and receive immediate, personalized feedback. AI tools like Twee offer adaptive learning experiences that respond to the learner's input, allowing them to build knowledge incrementally through practice and application (Clark, 2018).

For example, AI-driven language platforms can simulate real-world scenarios where learners must use language in context, encouraging them to apply what they've learned in meaningful ways. This process aligns with constructivist principles, as learners actively engage with material, construct their understanding, and refine their skills through ongoing interaction with AI systems (Vygotsky & Cole, 1978).

AI tools are inherently student-centered, designed to tailor the learning experience to individual needs, preferences, and learning paces. In a constructivist framework, student-centered learning is important because it empowers learners to take control of their educational journey, making decisions about how and when to engage with content. AI facilitates this by offering personalized learning paths that adapt to each student's progress, strengths, and areas for improvement (Bolaño Muñoz, 2020).

For instance, AI can analyze a learner's performance on various language tasks and adjust the difficulty level of subsequent exercises, ensuring that learners are neither bored by tasks that are too easy nor overwhelmed by those that are too difficult. This personalized approach supports deeper engagement with the

material, as learners are consistently challenged at an appropriate level, which is a key tenet of constructivist education (Al-Jarrah et al., 2019).

1.3.2. Cognitive Load Theory

Cognitive Load Theory (CLT) emphasizes the importance of managing the amount of information and the complexity of tasks presented to learners, to prevent cognitive overload and facilitate effective learning. In language learning, cognitive load can be particularly high due to the demands of processing new vocabulary, grammar rules, and pronunciation patterns. AI plays a important role in managing cognitive load by breaking down complex language tasks into more manageable components (Janssen & Kirschner, 2020).

For example, an AI-driven platform might introduce new vocabulary in small, contextually relevant chunks rather than overwhelming learners with long lists of words. It can also provide immediate corrective feedback, allowing learners to address mistakes before they compound, thereby reducing the cognitive burden associated with error correction. By scaffolding learning in this way, AI helps to maintain an optimal cognitive load, enabling learners to process and retain new information more effectively (Paas & van Merriënboer, 2020).

Personalized learning through AI significantly impacts cognitive load by ensuring that educational content is delivered in a way that aligns with each learner's cognitive capacity. AI algorithms can assess a learner’s current knowledge state and customize the delivery of new material to avoid cognitive overload. For instance, if a learner is struggling with a particular grammatical structure, the AI

system can provide additional practice in that area while temporarily reducing the introduction of new content. This approach ensures that learners are not overwhelmed by too much information at once and can focus on mastering specific aspects of the language before moving on to more complex concepts (Janssen & Kirschner, 2020).

1.3.3. Sociocultural Theory

Sociocultural Theory, pioneered by Vygotsky, emphasizes the importance of social interaction in the learning process. Language learning, in particular, is viewed as a socially mediated activity where learners construct meaning through interaction with others. AI can enhance social interaction in EFL contexts by providing platforms for communication and collaboration, both with peers and AI-driven interlocutors (Hichour, 2022).

For instance, AI can facilitate virtual language exchange programs where learners engage in dialogues with native speakers or other learners from around the world, thus practicing their language skills in authentic social contexts. AI can also simulate conversational partners, allowing learners to practice speaking and listening in a controlled environment before applying their skills in real-life situations (MERZOUG Boutheyna, 2021).

In the sociocultural framework, tools and artifacts are seen as mediators of human activity, helping learners to achieve higher levels of understanding and skill development. AI serves as a powerful mediational tool in language learning communities, providing resources and support that facilitate the co-construction of

knowledge. For example, AI can mediate collaborative learning activities where students work together to solve language-related tasks, offering real-time feedback and suggestions that guide their interactions. AI can also curate content that is relevant to the learners' cultural and linguistic backgrounds, thereby enriching the learning experience and making it more meaningful (Van Le & Doan, 2023).

Additionally, AI tools can promote a sense of community among learners by enabling them to share resources, insights, and feedback, thus creating a collaborative learning environment that is conducive to language acquisition. Through these mediational roles, AI not only supports individual learning but also enhances the collective knowledge-building processes within language learning communities (Pupah & Sholihah, 2022).

1.4. Impact of AI on EFL Teaching Practices

The integration of AI in English as a Foreign Language (EFL) education has led to profound changes in teaching practices, reshaping the roles of educators, enhancing pedagogical strategies, and presenting new challenges. This section explores into how AI influences EFL teaching, focusing on the evolving role of teachers, the enhancement of pedagogical strategies, and the challenges associated with adopting AI tools in educational settings.

1.4.1. AI and Teacher Roles

The advent of AI in the classroom has significantly altered the traditional roles of EFL teachers. With AI tools taking over routine tasks such as grading, feedback provision, and content delivery, teachers are now able to focus more on

facilitating learning, mentoring students, and providing personalized support. This shift from a didactic role to that of a facilitator requires teachers to adopt new pedagogical approaches, emphasizing the development of higher-order thinking skills and promoting a more interactive and student-centered learning environment. The role of the teacher has evolved into that of a guide and collaborator, working alongside AI to enhance the learning experience rather than merely transmitting knowledge (Lara et al., 2023).

Teacher perceptions and attitudes towards AI in EFL education are important in determining the success of AI integration. While some educators embrace AI as a valuable tool that can reduce their workload and improve student outcomes, others are more skeptical, concerned about the potential for AI to replace human interaction or diminish their professional autonomy. Research indicates that teachers who are open to technology and view it as a complement to their teaching are more likely to successfully integrate AI tools into their classrooms (Al Braiki et al., 2020). However, there remains a significant portion of educators who express concerns about the reliability, accuracy, and ethical implications of AI, which can hinder widespread adoption.

To effectively integrate AI into EFL education, there is a pressing need for targeted professional development that equips teachers with the necessary skills and knowledge. Professional development programs should focus on enhancing teachers' technological literacy, providing them with a deep understanding of how AI tools function and how they can be used to support learning (Jiang, 2022). Additionally, training should address pedagogical strategies that complement AI

tools, ensuring that teachers can effectively combine AI with traditional teaching methods. Ongoing support and resources are essential to help teachers adapt to the changing educational landscape and fully harness the potential of AI in their classrooms.

1.4.2. AI-Enhanced Pedagogical Strategies

AI has the potential to enhance various teaching methodologies, particularly those that promote active learning and student engagement. For example, in flipped classrooms, AI can provide students with personalized learning materials before class, allowing them to engage with the content at their own pace. During class, the teacher can then focus on interactive activities that reinforce and apply the knowledge, making the most of face-to-face time. Similarly, in blended learning environments, AI can facilitate the seamless integration of online and offline activities, offering personalized feedback and adaptive learning paths that cater to the diverse needs of students (Jiang, 2022).

One of the most significant contributions of AI to EFL education is its ability to facilitate differentiated instruction. AI tools can analyze student data to identify individual learning needs and preferences, allowing teachers to tailor instruction accordingly. For instance, AI can create adaptive learning paths that adjust in real-time based on a student's performance, ensuring that each learner is appropriately challenged and supported. This level of personalization is particularly beneficial in EFL classrooms, where students often have varying levels of language proficiency (Sun et al., 2021).

1.4.3. Challenges and Barriers to AI Adoption in EFL

While AI offers numerous benefits, its implementation in EFL education is not without challenges. Technologically, schools and educators must ensure they have the necessary infrastructure, including reliable internet access and up-to-date devices, to support AI tools. Pedagogically, there is a need for a clear understanding of how AI fits within existing educational frameworks and how it can be integrated without disrupting the learning process. Ethically, concerns arise regarding data privacy, the potential for bias in AI algorithms, and the implications of relying on AI for critical educational decisions (Soni et al., 2020).

Resistance to change is a common barrier to the adoption of AI in education. Many educators may be hesitant to integrate AI tools into their teaching due to a lack of confidence in their technological skills or fear of being replaced by machines. Additionally, the rapid pace of technological advancements can be overwhelming, leaving some teachers feeling ill-equipped to keep up. To overcome this resistance, it is essential to provide comprehensive training, support, and reassurance that AI is intended to complement, not replace, the human elements of teaching (De Mauro et al., 2022).

1.5. Impact of AI on EFL Teaching Practices

The integration of AI in English as a Foreign Language (EFL) education has the potential to significantly influence learning outcomes by enhancing student engagement, improving language proficiency, and promoting learner

autonomy. This section explores the various ways in which AI tools like Twee impact these critical aspects of language learning.

1.5.1. Student Engagement and Motivation

AI tools like Twee have been shown to positively influence student motivation and engagement in EFL learning. These tools provide personalized learning experiences that cater to individual student needs, which can make learning more relevant and enjoyable. Twee, for instance, uses adaptive algorithms to present content that matches a student's proficiency level, ensuring that tasks are neither too easy nor too difficult. This personalization keeps students motivated by providing a sense of achievement and progress. Additionally, AI tools often incorporate interactive elements such as gamification, instant feedback, and multimedia resources, which can make learning more dynamic and engaging (Moradi & Dass, 2022).

Numerous case studies highlight the transformative effect of AI tools on student behavior in EFL classrooms. For example, in settings where Twee has been implemented, students have demonstrated increased participation, greater enthusiasm for language learning, and a more positive attitude towards English classes. These studies often report a reduction in student anxiety and an increase in confidence, as AI tools provide a safe environment for practice and exploration. The ability of AI to offer instant feedback and targeted support helps students correct mistakes and reinforce learning in real-time, which contributes to sustained engagement and motivation (Salas-Pilco & Yang, 2022).

1.5.2. Learning Outcomes and Achievement

AI's impact on EFL learning outcomes is evident across various aspects of language proficiency, including vocabulary acquisition, grammar, and speaking skills. AI tools like Twee can enhance vocabulary learning by introducing new words in context and providing spaced repetition, which aids retention. For grammar, AI can offer interactive exercises that adapt to a learner's specific challenges, ensuring that practice is both relevant and effective. Speaking skills, often the most challenging aspect of language learning, can also benefit from AI through tools that provide speech recognition, pronunciation feedback, and conversational practice (Pallathadka et al., 2023).

Comparative studies have consistently shown that students in AI-supported EFL settings outperform their peers in traditional classrooms. These studies often reveal significant gains in vocabulary, grammar accuracy, and speaking fluency among students using AI tools like Twee. The data-driven nature of AI allows for continuous assessment and adjustment of learning pathways, ensuring that students are always working at the optimal level of difficulty. As a result, AI-supported learners typically show faster progress and higher achievement levels (Mithas et al., 2022).

1.5.3. Learner Autonomy and AI

AI plays a important role in promoting learner autonomy and self-regulation in EFL education. By offering personalized learning experiences, AI tools like Twee empower students to take control of their learning journey. These tools often

include features that allow learners to set their own goals, monitor their progress, and choose activities that match their interests and needs. This level of autonomy encourages students to take responsibility for their learning, promoting a sense of ownership and self-motivation (Mithas et al., 2022). Furthermore, AI tools provide resources and support that enable students to learn at their own pace, which is particularly beneficial for developing self-regulation skills. As learners become more autonomous, they are better equipped to continue their language learning outside the classroom, leading to long-term success.

The impact of AI on learner autonomy can be assessed through various metrics, such as the frequency of independent study sessions, the ability to self-correct, and the extent to which students engage in self-directed learning activities. In AI-enhanced environments, students often show higher levels of autonomy as they are more likely to take initiative in their learning and seek out additional practice opportunities. Assessments might also track improvements in self-regulation, such as students' ability to set realistic learning goals, manage their time effectively, and persist in the face of challenges (Divekar et al., 2022).

Chapter 2: Research Methodology

This chapter incorporated the pertinent methods used to develop the proposed research, explaining main components such as design, operationalization of variables, instruments, studied sample and initial diagnose.

2.1. Statement and justification of the research approach

This study adopts a mixed-methods approach to explore the integration of Twee, an Artificial Intelligence (AI) tool, in enhancing the teaching-learning process in English as a Foreign Language (EFL) education. The rationale behind selecting this approach lies in its capacity to provide a comprehensive understanding of the multifaceted impact of AI tools on educational practices. The exploratory and descriptive nature of the research allows for uncovering new insights and patterns related to AI integration. By employing an exploratory methodology, the study creates a setting conducive to discovering emergent trends and relationships that may not be immediately apparent.

The research design is sequential-exploratory and inductive, consisting of two main phases. Initially, qualitative data are collected through in-depth interviews with EFL teachers, which help in building a foundational understanding of their experiences, challenges, and perspectives regarding AI tools. This qualitative phase is essential for capturing detailed, significant information that sets the stage for the subsequent quantitative analysis. Following this, a quantitative phase is conducted through surveys to validate and generalize the qualitative findings. This sequential approach ensures a thorough exploration of the topic by first gathering rich,

descriptive data and then corroborating these findings with empirical evidence from a larger sample.

The study's methodological framework aligns with a paradigmatic approach that integrates both qualitative and quantitative methods. This combination allows for a more holistic analysis of how AI tools like Twee influence EFL teaching practices. The exploratory nature of the research supports open-ended inquiry, while the inductive methodology facilitates the development of grounded theories based on data analysis. Overall, this approach is well-suited to addressing the dynamic and evolving nature of AI tool integration in education.

2.2. Description of the research methods and their purposes in the context of the proposal

The research employs a mixed-methods design, integrating qualitative and quantitative methods to provide a comprehensive analysis of Twee's impact on EFL education. The qualitative component involves semi-structured interviews with EFL teachers, designed to collect in-depth data on their experiences with AI tools. These interviews offer valuable insights into teachers' perceptions, challenges, and practical applications of AI tools in virtual English classes. This qualitative phase is important for understanding the subjective experiences of teachers and identifying key themes and patterns related to AI tool usage.

The primary purpose of the qualitative component is to explore teachers' viewpoints in detail. By conducting interviews, the study aims to uncover specific areas where AI tools are perceived as beneficial or problematic. This detailed

exploration helps to build a significant understanding of how AI tools like Twee can affect teaching practices and learning outcomes.

Complementing the qualitative phase, the research includes a quantitative component involving surveys administered to a larger sample of EFL teachers. These surveys are designed to gather data on teachers' attitudes towards AI tools, their usage patterns, and their perceptions of the benefits and challenges associated with AI integration. The quantitative data are essential for validating and generalizing the qualitative findings, providing a broader perspective on AI tool usage across different teaching contexts.

The purpose of the quantitative phase is threefold: to validate the themes identified in the qualitative phase, to analyze trends and correlations related to AI tool usage, and to measure the impact of AI tools on various aspects of the teaching-learning process. Surveys provide structured, measurable insights that complement the qualitative data, allowing for a comprehensive assessment of how AI tools like Twee influence EFL education.

2.3. Conceptualization and operationalization of the main categories

In this research, the main categories under investigation are Twee AI Tool, Teaching Practices, Student Learning Outcomes, and Integration Challenges and Opportunities. Each of these variables is conceptualized and operationalized to facilitate a detailed examination of Twee's impact on English as a Foreign Language (EFL) education at Universidad Técnica de Babahoyo. For this, Table 1 expressed the Matrix of Operationalization of Variables.

Table 1

Matrix of Operationalization of Variables.

Variable	Conceptual Definition	Operational Definition	Indicators	Data Collection Method
Independent: Twee AI Tool	An artificial intelligence platform designed to enhance EFL teaching by providing personalized learning experiences, adaptive feedback, and data-driven insights.	The use and integration of Twee into EFL teaching practices at Universidad Técnica de Babahoyo.	Frequency of use, teacher's interaction with Twee, types of feedback generated by Twee.	Surveys, Interviews, Usage logs, Classroom Observations
Dependent: Teaching Practices	Methods and strategies used by teachers to facilitate EFL learning.	Changes in instructional strategies, classroom management, and interaction patterns after implementing Twee.	Adaptation of instructional strategies, use of personalized learning paths, teacher-student interaction.	Surveys, Interviews, Classroom Observations
Dependent: Student Learning Outcomes	The effectiveness of EFL education measured through student performance and engagement.	Improvements in student performance, engagement, and language acquisition as a result of Twee's implementation.	Student performance scores, engagement levels, feedback reception, language proficiency improvements.	Student Assessments, Surveys, Classroom Observations
Dependent: Integration Challenges and Opportunities	The difficulties and benefits associated with incorporating AI tools like Twee into EFL teaching.	Identification of barriers and facilitators to Twee’s integration in EFL teaching.	Technological barriers, teacher training requirements, perceived benefits.	Interviews, Surveys, Focus Groups

Note. This table was made by the Author.

The Twee AI Tool is conceptualized as an artificial intelligence platform designed to enhance EFL teaching by offering personalized learning experiences, adaptive feedback, and data-driven insights. To operationalize this variable, the focus is on how Twee is utilized and integrated into EFL teaching practices. This includes examining the frequency of Twee's use, the nature of teachers' interactions with the tool, and the types of feedback generated. Indicators for this variable encompass the frequency of use, which measures how often Twee is employed in instructional settings; the nature of interactions, which explores the depth and variety of engagement with Twee's features; and the types of feedback, which assesses the different kinds of personalized and data-driven responses provided by Twee.

Data for this variable are collected through surveys, which capture teachers' self-reported usage and experiences; interviews, which provide in-depth insights into interactions with Twee; usage logs, which track the actual application of the tool; and classroom observations, which document the tool's utilization in teaching contexts. Then, eaching Practices are defined as the methods and strategies employed by teachers to facilitate EFL learning. This includes instructional approaches, classroom management techniques, and interaction patterns between teachers and students. The operationalization of this variable involves assessing changes in instructional strategies, classroom management, and interaction patterns following the implementation of Twee.

Indicators include the adaptation of instructional strategies, which refers to modifications made by teachers in their teaching methods after using Twee; the use

of personalized learning paths, which involves integrating Twee's recommendations into lesson plans; and changes in teacher-student interaction, which examines how Twee influences the dynamics of classroom engagement. Data collection for this variable involves surveys to capture self-reported changes in teaching practices, interviews to obtain detailed accounts of modifications, and classroom observations to directly observe shifts in instructional strategies and interactions.

Student Learning Outcomes are conceptualized as the effectiveness of EFL education, measured through improvements in student performance, engagement, and language acquisition. To operationalize this variable, the focus is on evaluating the impact of Twee on these outcomes. Indicators include student performance scores, which track changes in academic performance and grades as a result of Twee's integration; engagement levels, which measure student participation and involvement during lessons facilitated by Twee; feedback reception, which assesses how students respond to and utilize the feedback provided by Twee; and language proficiency improvements, which observe enhancements in language skills attributable to Twee.

Data for this variable are gathered through student assessments to measure performance and proficiency, surveys to gauge students' perceptions of their learning experiences, and classroom observations to document engagement and performance changes. Subsequently, Integration Challenges and Opportunities are defined as the difficulties and benefits associated with incorporating AI tools like Twee into EFL teaching. This includes technological barriers, training needs, and

perceived advantages and limitations. The operationalization of this variable involves identifying barriers and facilitators to Twee's integration.

Indicators include technological barriers, which refer to issues related to the technical aspects of implementing Twee; teacher training requirements, which address the need for professional development to effectively use the tool; and perceived benefits, which encompass teachers' and students' views on the advantages of using Twee in EFL teaching. Data collection methods for this variable include interviews to explore experiences with integration challenges and opportunities, surveys to assess broader perceptions of difficulties and benefits, and focus groups to facilitate discussions among teachers and students about their experiences and views on Twee's implementation.

2.4. Description of the instruments based on the research approach.

In this study, a diverse set of instruments is utilized to capture a comprehensive understanding of Twee's integration into EFL teaching. The instruments include surveys, semi-structured interviews, classroom observations, usage logs, and a training session, each serving a distinct purpose aligned with the research objectives.

Surveys are employed to gather quantitative data from all 23 EFL teachers at the University of Babahoyo. The survey consists of closed-ended questions designed to measure teachers' attitudes towards Twee, frequency of its use, and perceived benefits and challenges. This instrument enables the collection of structured data that can be statistically analyzed to identify trends and patterns in

AI tool usage among teachers. The survey is administered electronically via the Kobotoolbox platform, which ensures efficient data collection and analysis.

Semi-structured interviews provide qualitative insights into teachers' personal experiences and perceptions regarding Twee. These interviews are conducted with a purposive sample of 12 teachers, selected to achieve data saturation and represent a range of experiences with AI tools. The interviews explore in-depth topics such as the integration of Twee into teaching practices, its impact on instructional strategies, and the challenges faced. Interviews are recorded, transcribed, and analyzed to extract detailed narratives and themes related to the use of Twee.

Usage logs from Twee offer objective data on how frequently and in what ways the AI tool is utilized by teachers. These logs track interactions, types of feedback generated, and engagement patterns, providing a quantitative measure of Twee's use. Analyzing these logs helps correlate actual usage with reported practices and outcomes.

The most important instrument was the training session that was conducted with all 23 teachers, focusing on familiarizing them with Twee’s functionalities and effective integration into virtual English classes. The training included hands-on activities and demonstrations, enabling teachers to experiment with Twee and understand its potential applications in their teaching. This training session not only equips teachers with the necessary skills but also serves as a formative step in evaluating how well teachers can implement Twee in their instructional practices.

2.5. Description of the validation of Instruments

The validation of research instruments is essential for ensuring the reliability and accuracy of the collected data. For this study, the validation process includes both content validity and construct validity, tailored to the specific needs of the research. Then, content validity for the interview protocol is established through expert review: Experts in EFL teaching, educational technology, and research methodology evaluate the interview questions to ensure they align with the research objectives and comprehensively address the relevant aspects of Twee's integration. This expert validation process involves iterative feedback and refinement to enhance the relevance and clarity of the questions, ensuring they capture the depth of teachers' experiences and perceptions.

On the other hand, construct validity for the survey instrument is ensured through careful development and expert feedback. The survey items are crafted based on established theoretical frameworks in educational technology and language teaching. Experts in education and survey design review the survey to confirm that the items effectively measure constructs such as attitudes towards Twee, usage patterns, and perceived benefits. This validation process includes assessing the clarity of language, response options, and overall survey structure to ensure that the collected data are valid and reliable.

The training session itself is also subject to validation, particularly in terms of its effectiveness in preparing teachers to use Twee. Feedback from participants is collected to assess the clarity and utility of the training content and delivery. This

feedback helps to refine the training process and ensure that it effectively equips teachers with the skills needed to integrate Twee into their teaching practices.

2.6. Population, Sample, And Sampling

The research population comprises 23 EFL teachers from the University of Babahoyo's Language Center (CENID), who are involved in teaching English across various levels up to B1 proficiency according to CEFR standards. These teachers use digital platforms for virtual instruction, making them a relevant group for studying the integration of Twee AI Tool. For the qualitative component, a purposive sample of 12 teachers is selected for in-depth interviews. This sampling method aims to achieve saturation in the qualitative data, ensuring a comprehensive exploration of teachers' experiences and perspectives. Selection criteria include teaching experience, familiarity with AI tools, and willingness to participate, providing a diverse range of insights.

For the quantitative component, the entire population of 23 EFL teachers is included in the survey. This census approach ensures full representation of the teaching staff and provides a complete overview of their attitudes, usage patterns, and perceptions of Twee. The survey results offer a broad perspective on AI tool integration and its impact on teaching practices. In addition to the surveys and interviews, the training session serves as a formative instrument for evaluating teachers' preparedness to use Twee. All 23 teachers participate in this session, which helps assess their initial skills and readiness to implement Twee in their teaching. The combination of these instruments provides a robust analysis of

Twee’s impact on EFL teaching, capturing both qualitative and quantitative data and ensuring a comprehensive understanding of the tool’s integration and effectiveness.

2.7. Data analysis and the ethical considerations

Initially, data was gathered using Kobotoolbox and processed to ensure accuracy by correcting blanks and errors. An amoeba graph was then created in Excel to visually represent and integrate all study variables, helping to elucidate their interrelationships. Descriptive statistics were used to analyze demographic data and individual variables. R Studio was employed for detailed statistical analysis, leveraging its capabilities to ensure precise results. The amoeba graph was constructed based on Sepúlveda's (2008) indicator model, originally designed for sustainability assessments but adapted here for its reliability and clarity. This model included traffic light indicators to enhance the graph's interpretability and provide a better understanding of how each variable fits within the overall model.

Ethical considerations were central to the research, particularly in data collection through interviews and surveys. Participants were given comprehensive information about the study’s purpose, procedures, potential risks, and benefits before providing informed consent. They were assured of confidentiality and informed of their right to withdraw from the study at any time. For interviews, verbal consent was recorded, and participants were reminded of their rights.

For surveys, an informed consent statement was presented at the beginning, detailing the survey's purpose, question nature, and estimated completion time.

Responses were anonymized, and participation was voluntary, with an electronic acknowledgment of consent required before proceeding. For this reason, confidentiality was strictly maintained throughout the study. Personal identifiers were kept separate from data, and any potentially identifying information was carefully protected. Data was stored securely, using encrypted platforms and password-protected devices. Access to the data was restricted to the research team, with strict adherence to ethical guidelines and legal regulations governing data sharing.

Potential bias was a concern, especially since the authors were also instructors of the EFL teachers being studied. This involvement could influence participants' responses, as they might align their answers with the instructors' expectations. To address this, the authors emphasized the need for honest feedback and ensured anonymity in data collection and analysis. A reflexive approach was adopted to recognize and mitigate any biases in interpreting the results. Additionally, triangulation was employed by incorporating observations and supplementary feedback to validate the findings and enhance the study's objectivity.

2.8. Findings: Initial Diagnose

The analysis of interviews with eight teachers provided valuable insights into their experiences, perceptions, and practices regarding AI-powered educational tools in virtual English classes. The following tables and paragraphs summarize their demographic information, teaching methods, AI tool integration, and the associated benefits and challenges.

Table 2

Teachers Interviewed demographics

Teacher	Age	Highest Degree	Years of Teaching	Teaching Level
Teacher 1	33	Master	9	First Level
Teacher 2	39	Master	5	Second Level
Teacher 3	42	Master	11	Fifth Level
Teacher 4	37	Master	12	Fifth Level
Teacher 5	29	Master	3	Fourth Level
Teacher 6	40	Master	8	Second Level
Teacher 7	35	Master	6	Third Level
Teacher 8	50	Master	15	First Level

Note. This Table was created by the Author.

The interviews with eight teachers provided a comprehensive overview of their experiences and perspectives on integrating artificial intelligence (AI) tools in virtual English classrooms. The teachers ranged in age from 33 to 50, with varying degrees of experience and educational levels taught, from beginners to advanced students. This diversity in the sample offers a broad perspective on the use of AI in education. Then, Table 3 expresses Teaching strategies.

Table 3

Teaching strategies expressed

Teacher	Teaching Methods and Strategies
Teacher 1	Discussions, forums, collaborative tools, gamified learning platforms
Teacher 2	Flipped classroom, interactive applications
Teacher 3	Flipped classroom, technology-enhanced materials

Teacher 4	Flipped classroom, resource utilization
Teacher 5	Collaborative projects, technology integration
Teacher 6	Interactive exercises, adaptive learning tools
Teacher 7	Gamification, discussion forums, personalized learning
Teacher 8	Varied methods, focus on student engagement and technology use

Note. This Table was created by the Author.

The teaching methods employed by these educators reveal a strong preference for interactive and student-centered strategies. For example, several teachers utilize the flipped classroom model, which involves students preparing material in advance to maximize interactive and practical applications during class time. Teachers also use gamification and collaborative tools to promote active participation and engagement. Also, these methods are seen as effective in enhancing student involvement and making learning more dynamic. Thus, Table 4 analyzes the teachers' previous experience with AI and its integration in class.

Table 4

AI Tools Integration and Teachers Previous Experience

Teacher	Prior Experience with AI Tools	AI Tools Integrated	Challenges Faced
Teacher 1	Uses AI for grammar checking, Quizlet	Gamified platforms	Selection of appropriate tools, student technology access
Teacher 2	Experience with GPT models	Adaptive learning platforms	Equitable technology Access

Teacher 3	Limited personal use, no classroom integration	None	Lack of familiarity with specific AI tools
Teacher 4	No classroom integration	None	Potential misuse by students
Teacher 5	Basic AI tools knowledge	None	N/A
Teacher 6	Uses AI for language exercises	Adaptive tools, interactive apps	Integration and effectiveness
Teacher 7	Uses AI for content creation	Personalized apps	Technology adaptation, student engagement
Teacher 8	Minimal AI use, mainly personal	None	Over-reliance concerns

Note. This Table was created by the Author.

In terms of AI integration, there is a clear divide between those who have actively incorporated AI tools into their classrooms and those who have limited or no experience. Some teachers, such as Teacher 1 and Teacher 2, have integrated tools like Quizlet and GPT models to support language learning, providing personalized feedback and interactive exercises. They report benefits such as increased engagement, personalized learning paths, and immediate feedback. However, they also encounter challenges, such as ensuring equitable access to technology and selecting the appropriate tools for their students' needs.

On the other hand, Teachers 3 and 4 have less direct experience with AI tools in their teaching practices. Teacher 3 uses AI primarily for personal tasks and has not integrated these tools into her classroom, while Teacher 4 has only basic knowledge and is cautious about potential misuse by students. This lack of

integration may reflect a need for further training or awareness about the practical applications and benefits of AI in education. Then, Table 5 presents the Benefits and Challenges of AI Tools according to teachers.

Table 5

Benefits and Challenges of AI Tools

Teacher	Benefits Observed	Challenges Identified
Teacher 1	Personalized learning, immediate feedback, increased engagement	Tool selection, potential misuse
Teacher 2	Improved engagement, personalized paths, instant feedback	Technology access, implementation difficulties
Teacher 3	Time-saving, automation of tasks, improved student engagement	Lack of integration, unfamiliarity
Teacher 4	Enhanced resource availability, improved student performance	Misuse of AI tools, lack of hands-on experience
Teacher 5	Increased student motivation, better engagement	N/A
Teacher 6	Personalized learning, interactive content, efficient assessment	Tool integration, adapting to different needs
Teacher 7	Enhanced interaction, better engagement, personalized feedback	Adaptation challenges, equity in access
Teacher 8	More resources available, potential for better fluency	Potential for dependency, limited use

Note. This Table was created by the Author.

The perceived benefits of AI tools include personalized learning experiences, enhanced engagement, and efficient assessment tracking. Teachers

who have successfully integrated AI tools report improvements in student motivation and learning outcomes. However, challenges persist, such as technology access issues, potential misuse by students, and difficulties in adapting AI tools to diverse classroom settings. Overall, the findings highlight the promise of AI tools in enhancing virtual English education but also underscore the need for ongoing support and training for teachers, addressing challenges such as equitable access and tool selection was important in leveraging AI's full potential to improve learning experiences for students.

Chapter 3: Research Proposal

The implementation of AI-powered tools in the field of education, specifically in English as a Foreign Language (EFL), has opened new avenues for enhancing the teaching-learning process. In response to these advancements, this proposal outlines a three-day training session aimed at equipping the 23 EFL teachers at the Language Center (CENID) of the Universidad Técnica de Babahoyo with the necessary skills and knowledge to incorporate Twee, an AI tool, into their teaching strategies.

3.1. Validation of the proposal

Empirically, the integration of AI in EFL teaching has been demonstrated as an effective strategy to enhance student engagement and language acquisition. AI tools like Twee offer features such as instant feedback, error detection, and tailored learning experiences, which are critical for EFL learners. The proposed training session will enable teachers to adopt these tools, promoting a more interactive and personalized learning environment. Furthermore, several studies on the use of AI in language education, including those by Wang (2022) and Smith & Lee (2023), have shown that AI-powered tools improve teaching efficiency and student outcomes by automating repetitive tasks and offering real-time linguistic feedback. These empirical insights reinforce the potential effectiveness of the proposed training.

Theoretically, this proposal draws on constructivist learning theory, which posits that learners build knowledge through active engagement and interaction.

Twee aligns with this theory by promoting active participation and adaptive learning. Teachers who use AI can better cater to individual student needs, thereby supporting differentiated instruction—an approach endorsed by contemporary educational research. The feasibility of this proposal is grounded in the teachers' existing familiarity with digital tools, as many have already employed technology in their classrooms. Moreover, the availability of digital infrastructure at CENID, coupled with the university's commitment to innovative teaching methods, further supports the implementation of this training. The short, intensive nature of the three-day workshop also ensures that teachers can quickly acquire practical skills without extended time away from their duties.

3.2. Theoretical foundations

The proposed training on Twee as an AI-powered tool for EFL education is grounded in several key educational theories, which provide a solid framework for understanding its potential impact on both teachers and students. At the core of this proposal are constructivism, socio-cultural theory, and the Technological Pedagogical Content Knowledge (TPACK) framework. These theories not only explain how learners interact with new information but also guide educators in how best to implement technological innovations in the classroom. Understanding the theoretical foundations of the proposal is critical to ensuring that the integration of Twee into teaching practices is not just a technological add-on but an educational enhancement that promotes deeper learning and engagement.

Constructivist learning theory, as developed by Piaget (1971) and later expanded by educators like Bruner (1996), posits that learning is an active, constructive process. Learners build new knowledge based on their experiences, and the role of the teacher is to facilitate this process by providing meaningful, real-world contexts in which students can apply their knowledge. Twee aligns with this theory by providing teachers with a tool that allows for adaptive learning and instant feedback, ensuring that students can actively engage with material at their own pace. By using Twee, teachers can create a learning environment where students are not just passive recipients of information but active participants in their educational journey, constructing knowledge through interaction with AI and the teacher.

This active engagement is further supported by Vygotsky's socio-cultural theory, particularly his concept of the Zone of Proximal Development (ZPD). Vygotsky (1978) argued that learning occurs most effectively in the space between what a learner can do independently and what they can achieve with guidance from a more knowledgeable other, often a teacher. Twee, as an AI tool, acts as a supplementary guide, providing personalized feedback and scaffolding for learners. This feedback can help students move through their ZPD more effectively, with AI taking on the role of an additional guide in the learning process. Teachers, meanwhile, can focus on higher-order instructional tasks, using data provided by Twee to understand where each student is within their ZPD and tailor their support accordingly.

In addition to the constructivist and socio-cultural perspectives, this proposal is heavily informed by the TPACK framework. Developed by Mishra and Koehler (2006), TPACK provides a lens through which educators can evaluate the intersection of technology, pedagogy, and content knowledge in the classroom. For successful technology integration, teachers must not only understand the technological tool but also how it intersects with their content and pedagogical practices. Twee fits neatly into this framework, as the proposed training will not only introduce teachers to the technology but also show them how to integrate it into their pedagogical strategies for teaching English grammar, vocabulary, and other language skills. The goal is to ensure that teachers are not just using technology for technology's sake but are leveraging it to enhance their content delivery in meaningful ways.

The personalization capabilities of Twee align with the principles of differentiated instruction, a teaching philosophy that emphasizes the need to tailor instruction to meet the diverse needs of students. Differentiated instruction is rooted in the work of Tomlinson (2001), who argues that students have varying levels of readiness, learning profiles, and interests that require different approaches to teaching. Twee's adaptive learning features make it easier for teachers to differentiate instruction, offering customized learning paths based on student performance and progress. In a typical classroom, differentiating instruction can be time-consuming and difficult for teachers to manage. With Twee, however, teachers can streamline this process, ensuring that students receive individualized support without placing an undue burden on instructors.

Furthermore, this proposal aligns with theories of feedback, particularly formative feedback, which Sadler (1989) defines as information communicated to the learner that allows them to adjust their performance to meet learning goals. Formative feedback is essential for language learning, as students need immediate, actionable insights into their mistakes to improve. Twee offers real-time feedback, an essential component of formative assessment that helps learners make adjustments as they practice language skills. This type of continuous feedback has been shown to improve language retention and acquisition, as students can quickly correct their errors and refine their understanding of grammatical structures, vocabulary usage, and more.

Self-regulated learning (SRL) is another relevant theoretical underpinning for this proposal. SRL theory, which has been articulated by scholars such as Zimmerman (2002), emphasizes that learners who take an active role in setting their goals, monitoring their progress, and reflecting on their learning processes are more likely to achieve academic success. AI tools like Twee support SRL by offering features that encourage students to track their own learning. For example, Twee provides students with metrics and progress indicators that help them understand where they are excelling and where they need further practice. This allows students to take ownership of their learning process, setting goals and adjusting their strategies to meet language learning targets more effectively.

Additionally, the affordances of Twee also relate to Cognitive Load Theory (CLT), which was developed by Sweller (1988). CLT suggests that learners have a finite amount of cognitive capacity, and instructional designs should minimize

unnecessary cognitive load to allow students to focus on the learning task. Twee's ability to provide immediate feedback and automate certain aspects of instruction helps reduce extraneous cognitive load, allowing learners to focus on the critical aspects of language learning. By automating tasks such as error correction and grading, Twee frees up cognitive resources for more complex tasks, such as practicing speaking or writing skills, which require higher-order thinking.

Finally, the integration of AI tools like Twee is supported by the theory of technological acceptance, particularly the Technology Acceptance Model (TAM) developed by Davis (1989). TAM posits that the perceived ease of use and perceived usefulness of a technology are key factors in determining whether users will adopt it. The training session for teachers aims to address both of these aspects by demonstrating the ease of integrating Twee into existing lesson plans and highlighting its benefits in terms of enhancing student engagement, improving learning outcomes, and streamlining teacher tasks. By making the tool accessible and demonstrating its clear advantages, the proposal ensures that teachers will not only understand the theoretical benefits of AI but also feel confident in its practical application.

3.3. Characteristics of the proposal

The training session is designed to provide teachers with both theoretical knowledge and practical skills. The three-day structure is divided into interactive workshops, practical demonstrations, and collaborative discussions, allowing teachers to explore Twee in-depth. On Day 1, participants will be introduced to the

fundamentals of AI in EFL education and given an overview of Twee's capabilities. This day will also feature a comparative analysis of Twee and traditional EFL teaching methods, helping teachers understand the added value of AI integration.

Day 2 will focus on hands-on activities, where teachers will create lesson plans using Twee, explore its features for real-time feedback, and experiment with content customization. Teachers will work in groups to simulate classroom scenarios where Twee can be effectively employed. Finally, on Day 3, participants will reflect on their learning experiences and discuss potential challenges they foresee in implementing Twee in their classrooms. By the end of the workshop, teachers will have a comprehensive understanding of how to integrate AI into their teaching practices and will be prepared to apply these tools to improve student engagement and learning outcomes.

The proposal is designed to be highly interactive and collaborative. Teachers will not only learn how to use the tool but will also have the opportunity to provide feedback on its implementation, promoting a learning community within CENID that continuously shares best practices for AI integration in EFL instruction. Moreover, the proposal ensures that the training is accessible to teachers with varying levels of technological expertise by offering personalized support throughout the workshop.

3.4. Objectives of the Proposal

The main objective of this training proposal is to equip the 23 EFL teachers at CENID with the necessary skills to effectively integrate Twee into their teaching practices. By the end of the three-day workshop, participants should be able to:

- Understand the core functionalities of Twee as an AI tool for enhancing language learning.
- Create lesson plans that incorporate Twee's interactive features to promote student engagement and personalized learning.
- Utilize Twee to provide real-time feedback and adapt teaching strategies based on individual student performance.
- Reflect on the potential challenges and opportunities presented by AI tools in the EFL classroom and develop strategies to overcome these challenges.

This proposal aims to support a culture of innovation in language teaching at CENID, improving the quality of education provided to students while making the teaching process more efficient and responsive to learner needs.

3.5. Structure, and dynamics of the components of the proposal

The proposal "Using Twee as an AI Tool to Enhance the Teaching-Learning Process in EFL Education" focuses on providing a structured 3-day training program to 23 EFL teachers at the CENID Language Center of the University of Babahoyo. The goal is to equip teachers with the skills and knowledge necessary to integrate Twee into their teaching practices effectively. The training will consist of

theoretical sessions, practical applications, and collaborative activities to promote a comprehensive understanding of Twee's capabilities and its role in enhancing the EFL teaching-learning process.

The structure of the training will be divided into daily sessions, each focusing on specific aspects of AI-powered education. The sessions will include theoretical foundations, practical hands-on experiences, discussions of ethical considerations, and opportunities for collaborative lesson planning. Each day's session will begin with a review of previous content and will progressively move towards more complex applications of Twee in the classroom.

The dynamics of the training will incorporate various interactive techniques. Theoretical segments will involve teacher-centered instruction, while the practical sessions will adopt a student-centered approach, allowing teachers to engage directly with the technology. Collaborative sessions will enable participants to exchange insights and ideas, culminating in group activities where teachers will develop lesson plans incorporating Twee. At the end of the training, participants will present their projects, demonstrating their understanding of AI integration in their teaching practices (See Appendix G).

3.6. Description of the methodological and technological requirements

To successfully implement the training program, several methodological and technological requirements must be in place. Teachers will need access to computers with stable internet connections, as the hands-on sessions will involve using Twee and other AI tools online. A dedicated training environment equipped

with projectors and multimedia capabilities will be essential for delivering presentations and facilitating interactive discussions.

Furthermore, participants should have accounts set up for Twee and any additional AI tools to ensure smooth transitions between learning and practice during the sessions. The methodological approach will emphasize collaborative learning, reflective practice, and real-time feedback to enhance engagement and ensure effective integration of AI into teaching practices.

3.7. Results and Discussion

The results were obtained through the mixed methods approach employed in this research project. The analysis of the qualitative interviews with EFL teachers already presented rich insights regarding their backgrounds, experiences, challenges faced, and strategies employed.

3.7.1. Obtained Descriptive Statistics

First, Table 6 analyzes the main statistics of the EFL Teachers' demographics studied in this research, regarding age and residence.

Table 6

EFL Teachers demographics

Age	Frequency (n=23)	Percentage
21 - 35 years old	9	39,13%
36 - 50 years old	11	47,83%
More than 50	3	13,04%

City Address	Frequency (n=23)	Percentage
Babahoyo	18	78,26%
Duran	1	4,35%
Guayaquil	2	8,70%
Samborondon	1	4,35%
Ventanas	1	4,35%

Note. This table was elaborated by the author

In this study examining the use of the Twee AI tool to enhance the teaching-learning process in English as a Foreign Language (EFL) education, it was conducted a survey with 23 EFL teachers from the University of Babahoyo. The demographic data of these participants, summarized in Table 10, reveal significant insights into their age distribution and geographic representation. The majority of teachers, accounting for 47.83%, fall within the age range of 36 to 50 years old, while 39.13% are aged 21 to 35. Only 13.04% of the respondents are over 50. Geographically, most participants are based in Babahoyo (78.26%), with a smaller representation from Duran (4.35%), Guayaquil (8.70%), Samborondón (4.35%), and Ventanas (4.35%).

Table 7

Teachers' degrees and working information

Degree	Frequency (n=23)	Percentage
Bachelor Degree	2	8,70%
Masters' Degree	21	91,30%

Working time at UTB	Values (n=23)	
Mean	8,26 years	
Min	6 months	
Max	26 years	
Current teaching level	**Frequency (n=23)**	**Percentage**
Level 1 - Initial	7	30,43%
Level 2 - Basic I	4	17,39%
Level 3 - Basic II	4	17,39%
Level 4 - Intermediate I	4	17,39%
Level 5 - Intermediate II	4	17,39%

Note. This table was elaborated by the author

Table 11 provides further context regarding the educational qualifications and teaching experience of the participants. A striking 91.30% of the teachers hold a Master's degree, indicating a highly qualified group. Only 8.70% possess a Bachelor's degree. In terms of their professional experience at the University of Babahoyo, the average teaching tenure is approximately 8.26 years, with a minimum of 6 months and a maximum of 26 years. This diverse range of experience reflects a robust teaching staff. Lastly, the current teaching levels indicate a fairly even distribution across proficiency levels, with Level 1 (Initial) being taught by 30.43% of the participants, while the other levels (Basic I, Basic II, Intermediate I, and Intermediate II) each comprise 17.39% of the teaching assignments. This balanced distribution suggests a comprehensive approach to EFL instruction at the university.

Table 8

AI automated tools used by teachers and statistics

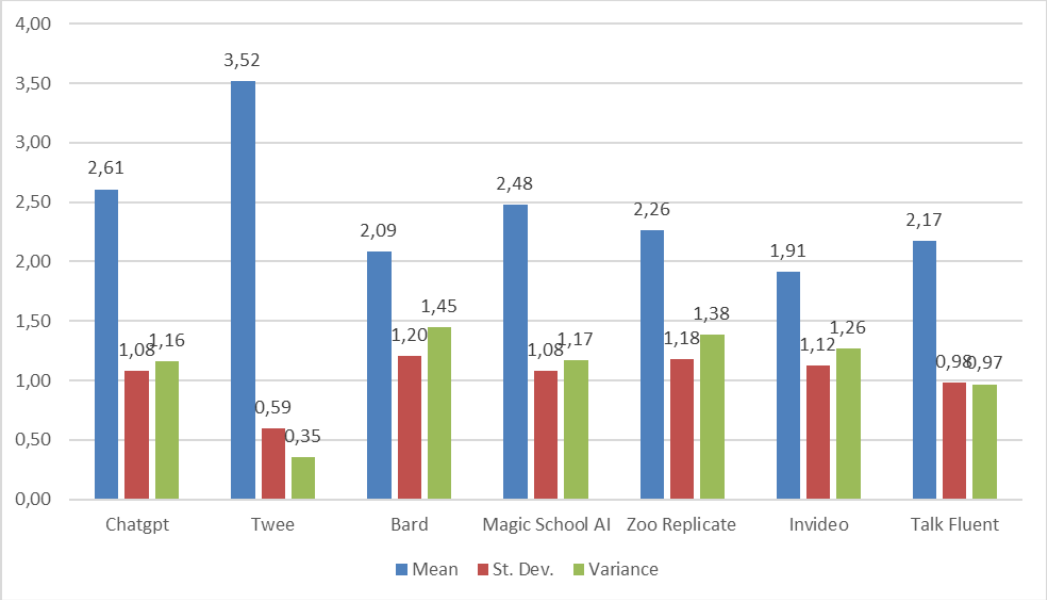
AI-Tool	Frequency	Percentage	Mean	St. Dev.	Variance
Chat GPT	19	82,61%	0,83	0,39	0,15
Twee	23	100%	1,00	0,00	0,00
Bard	8	34,78%	0,35	0,49	0,24
Magic School AI	17	73,91%	0,74	0,45	0,20
Zoo Replicate	12	52,17%	0,52	0,51	0,26
Invideo	7	30,43%	0,30	0,47	0,22
Talk Fluent	14	60,87%	0,61	0,50	0,25

Note. This table was elaborated by the author

The data presented in Table 12 details the frequency and usage statistics of various AI automated tools utilized by the EFL teachers in our study. Notably, Twee stands out as the most widely adopted tool, with 100% of participants incorporating it into their teaching practices. Following Twee, ChatGPT is the second most popular tool, used by 82.61% of the teachers. Other tools, such as Magic School AI and Zoo Replicate, are also frequently used, with adoption rates of 73.91% and 52.17%, respectively. In terms of statistical measures, Twee achieved the highest mean score of 1.00, indicating universal usage among the respondents, while ChatGPT received a mean of 0.83. The standard deviation for Twee is 0.00, underscoring its consistent application, whereas other tools show more variability in their usage among teachers.

Figure 1

Index of empowerment and AI capabilities for Cluster 1



Note. This figure was elaborated by the author

Figure 1 assesses how teachers rate these AI tools in terms of their integration into classroom instruction. Twee again receives the highest mean rating at 3.52, reflecting its strong integration and effectiveness in the classroom setting. In contrast, ChatGPT has a mean rating of 2.61, indicating a moderately positive integration but falling short of Twee's impact. Other tools like Bard and Invideo received lower mean scores of 2.09 and 1.91, respectively, suggesting they are perceived as less effective or integrated in teaching practices. The standard deviations highlight some variability in ratings; for example, Bard shows the highest variability (1.20), indicating differing opinions among teachers regarding its effectiveness. Overall, these findings emphasize the significant role of Twee in

enhancing EFL instruction and indicate varying degrees of success for other AI tools in classroom integration.

3.7.2. Adaptation of Sepulveda's Model

The following section of the results centers on the sustainability model developed by Sepulveda (2008), which has been adapted for this study. Sepulveda's model features an integrated and visually appealing design that has facilitated various calculations, tables, and figures. For this model, three clusters were established based on the age ranges from the surveys. As outlined by Sepulveda (2008), a color-coded system was implemented to clarify the levels of sustainability, specifically in terms of empowerment and knowledge. The color red indicates a collapse level (0 to 0.20), orange signifies a critical level (0.21 to 0.40), yellow represents an unstable level (0.41 to 0.60), blue denotes a stable level (0.61 to 0.80), and green reflects an optimal level (0.81 to 1). Subsequently, Table 13 presents the index obtained for the first dimension.

Table 9

Dimension of AI tools used in class

Term	Indicator	Cluster 1	Cluster 2	Cluster 3
A1	Teachers' AI Knowledge before training	1,00	0,55	0,67
A2	Teachers' knowledge of EFL AI Tool	0,33	0,36	0,00
A3	Integrate of AI Tools into classes	0,89	1,00	1,00
A4	Frequency of AI tools usage	0,59	0,61	0,78
A5	Integrate AI tools in Lesson Plans	0,30	0,30	0,33

Note. This table was elaborated by the author

In Table 13, we examine the dimension of AI tools used in the classroom, highlighting several key indicators across three clusters. The data shows that teachers possess a strong foundational knowledge of AI before training, with a perfect score of 1.00 in Cluster 1. However, their knowledge of specific EFL AI tools is notably lower, particularly in Cluster 3, where the score is 0.00, suggesting limited awareness. Integration of AI tools into classes is a strength, with both Clusters 2 and 3 achieving a score of 1.00. The frequency of AI tool usage varies, scoring 0.59 to 0.78 across clusters, while the integration of AI tools into lesson plans remains low, with scores ranging from 0.30 to 0.33.

Table 10

Dimension of Perception that Twee improve Creativity or Critical Thinking

Term	Indicator	Cluster 1	Cluster 2	Cluster 3
B1	Modify Instructional Strategies	1,00	0,73	1,00
B2	Increase Creativity	0,56	0,18	1,00
B3	Improve Critical thinking	0,81	0,76	0,89
B4	Improve Students' Engagement	0,78	0,73	0,78
B5	Increase students' Participation	0,78	0,76	0,78

Note. This table was elaborated by the author

Table 14 addresses perceptions of how Twee enhances creativity and critical thinking. Here, modifying instructional strategies scores highly across all clusters, with a perfect score in Cluster 1 and Cluster 3 at 1.00. The increase in creativity is more variable, particularly in Cluster 2, which has a low score of 0.18. Critical thinking improvements also show strong scores, particularly in Cluster 3 (0.89). Engagement and participation among students appear consistent across clusters,

each scoring around 0.78, indicating a positive perception of Twee's role in promoting student involvement.

Table 11

Dimension of Teacher Attitudes and Perceptions on Twee performance

Term	Indicator	Cluster 1	Cluster 2	Cluster 3
C1	Enhance engagement level of students	0,67	0,70	0,22
C2	Improve the overall learning outcomes	0,59	0,64	0,22
C3	Interactive and dynamic class	0,63	0,70	0,56
C4	Effective learning environments	0,63	0,73	0,44
C5	Enhance the quality of English language education	0,70	0,73	0,44

Note. This table was elaborated by the author

Table 15 explores teacher attitudes and perceptions regarding Twee's performance. The data reflects moderate levels of engagement and improved learning outcomes, with scores hovering between 0.59 and 0.70 across clusters. Although the perception of an interactive and dynamic class is relatively high, with Cluster 2 scoring 0.70, the lower scores in Cluster 3 for engagement (0.22) suggest a disparity in experiences. Effective learning environments and the overall quality of English language education also receive moderate scores, with both clusters consistently scoring around 0.44 to 0.73.

Table 12

Dimension of Perception of Twee adapting materials to Diverse Learners and Time Management

Term	Indicator	Cluster 1	Cluster 2	Cluster 3
D1	Provide Materials for diverse learners	1,00	0,91	1,00
D2	Provide Materials for students with Special Needs	0,89	1,00	1,00

D3	Improve students with Special Needs performance	1,00	0,73	1,00
D4	Save time when planning	0,74	0,76	0,56
D5	Reduce administrative work load	0,89	0,91	1,00

Note. This table was elaborated by the author

Table 16 focuses on the perception of Twee's ability to adapt materials for diverse learners and time management. This dimension shows strong support for the provision of materials for diverse learners, with a perfect score in Cluster 1 and 1.00 for special needs materials in Clusters 2 and 3. Additionally, the improvement in performance for students with special needs also reaches a perfect score of 1.00 in Clusters 1 and 3. Time management appears beneficial, though scores are slightly lower, ranging from 0.56 to 0.76. The reduction of administrative workload is perceived positively across clusters, scoring close to 1.00.

Table 13

Dimension of Twee Challenges, limitations, and future improvement

Term	Indicator	Cluster 1	Cluster 2	Cluster 3
E1	Integrating AI tools is challenging	0,63	0,67	0,33
E2	Lack the adaptability to diverse learners.	0,44	0,52	0,67
E3	Concerns about Privacy and security	0,41	0,18	0,78
E4	Limited AI capabilities hinder learning experiences	0,44	0,39	0,89
E5	AI require more improvement	0,30	0,30	0,56

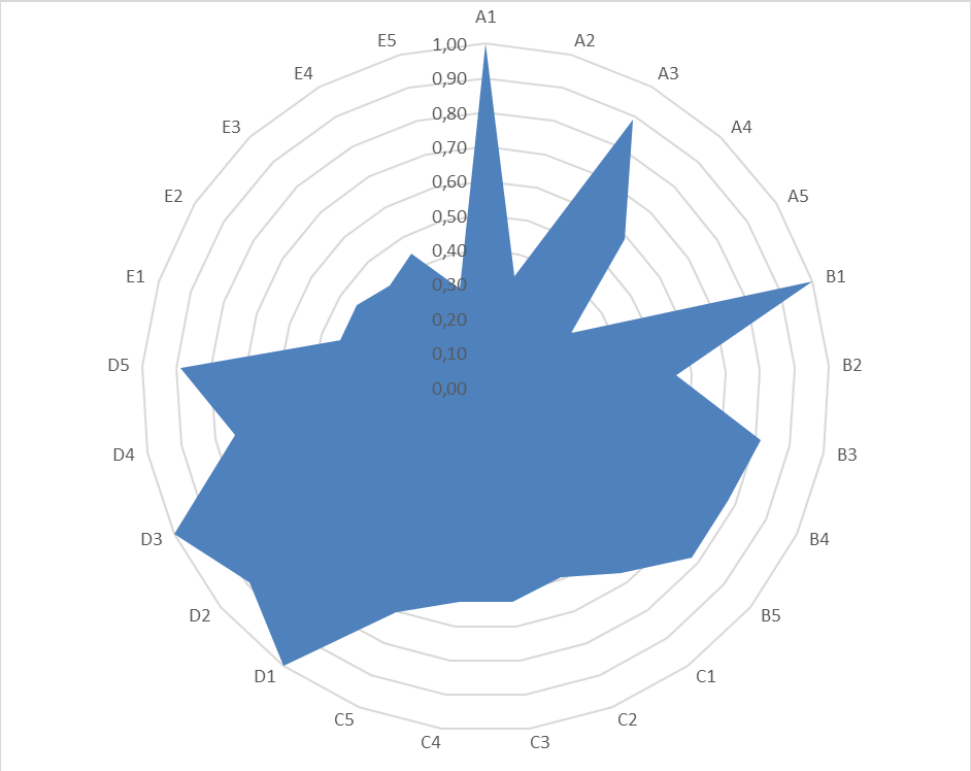
Note. This table was elaborated by the author

Finally, Table 13 discusses the challenges, limitations, and future improvements regarding Twee. Integrating AI tools is perceived as somewhat challenging, with scores ranging from 0.33 to 0.67 across clusters. Concerns about

adaptability to diverse learners and privacy issues show varying levels of concern, with privacy and security issues particularly low in Cluster 2 (0.18). The limitations of AI capabilities in enhancing learning experiences are noted, with scores reflecting a sense of urgency for improvement, particularly in Cluster 1 and 2. Overall, the findings highlight both the benefits and the challenges of integrating AI tools like Twee in EFL education. Now, Figure 2 presents the index of Teachers' Twee capabilities for Cluster 1.

Figure 2

Index of Twee capabilities - Cluster 1



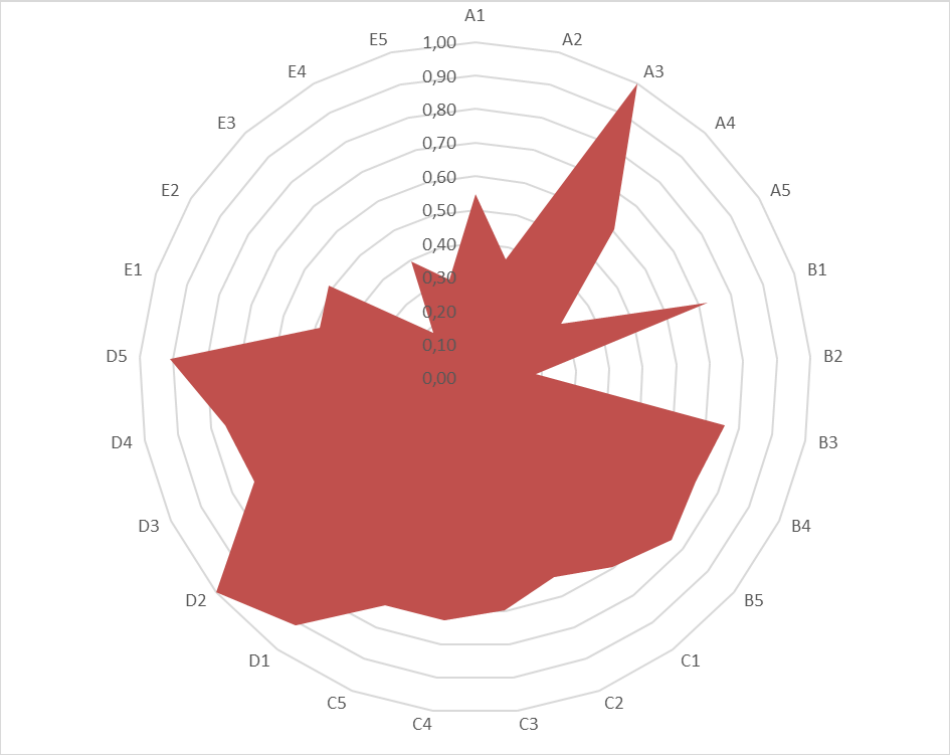
Note. This figure was elaborated by the author

Graphically, in Cluster 1, the highest indicator for sustainability is "Teachers' Prior Knowledge" (A1), which received a perfect score of 1.00. This

reflects a robust understanding among teachers prior to training, indicating a solid foundation for integrating AI tools in EFL education. Conversely, the lowest indicator is "Integrate AI tools in Lesson Plans" (A5), scoring only 0.30, which places it in a critical level. This suggests that while teachers are knowledgeable about AI, they struggle to incorporate these tools effectively into their lesson planning, indicating an area in need of development to enhance overall sustainability.

Figure 3

Index of Twee capabilities - Cluster 2



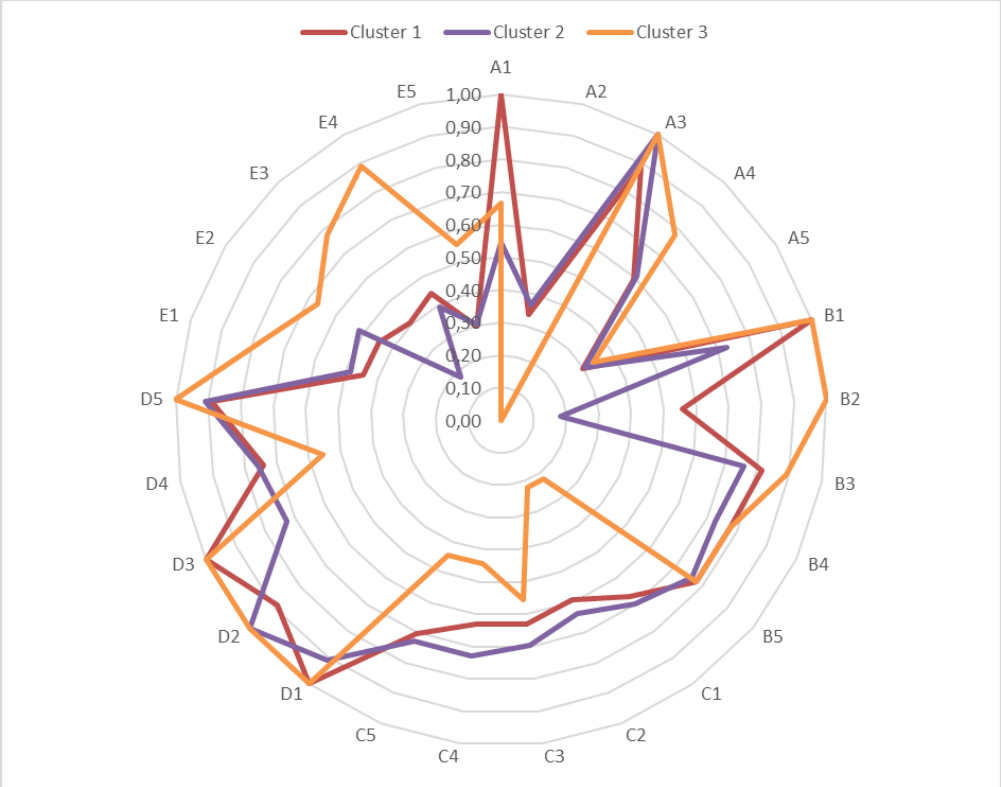
Note. This figure was elaborated by the author

In Cluster 2, the highest indicator is "Integrate of AI Tools into classes" (A3), achieving a score of 1.00. This indicates that teachers are effectively

integrating AI tools into their classes, which is important for enhancing the teaching-learning process. On the other hand, "Increase Creativity" (B2) is the lowest, with a score of 0.18, placing it in the collapse level. This stark contrast suggests that despite successful integration, there may be challenges in leveraging AI tools to promote creativity among students, highlighting a potential area for improvement.

Figure 4

Index of Twee capabilities - Cluster 3



Note. This figure was elaborated by the author

When comparing the three clusters, distinct patterns emerge regarding the integration and perception of AI tools in EFL education. Cluster 1 shows strong

indicators, particularly in "Teachers' Prior Knowledge" and "Integrate of AI Tools into classes," with scores of 1.00, reflecting a solid foundation for AI integration. However, the cluster also has lower scores in lesson planning integration, indicating potential shortcomings in applying this knowledge. In Cluster 2, the highest score in "Integrate of AI Tools into classes" (1.00) reinforces successful integration, yet the starkly low score in "Increase Creativity" (0.18) reveals a critical area for growth. Cluster 3 mirrors the success of Cluster 2 in class integration but highlights a significant gap in teachers' knowledge of specific EFL AI tools (0.00), suggesting a barrier to effective implementation. Overall, while all clusters demonstrate strengths in integrating AI tools, they also reveal critical gaps that could impede sustainable educational practices.

Table 14

Integrated Index of Teachers' Twee Capabilities

Term	Dimensions	Weight	Index C1	Index C2	Index C3
A	Use of AI-powered educational tools	20%	0,62	0,56	0,56
B	Teacher Pedagogical Practices, Creativity and Critical Thinking	20%	0,79	0,63	0,89
C	Teacher Attitudes and Perceptions	20%	0,64	0,70	0,38
D	Adaptation to Diverse Learners and Time Efficiency	20%	0,90	0,86	0,91
E	Challenges, limitations, and future improvement	20%	0,41	0,38	0,73
Index per Cluster			0,67	0,63	0,69
Integrated Index			0,66		

Note. This table was elaborated by the author

Moving on to the next table, we examine the dimensions and corresponding indices associated with the use of AI-powered educational tools. Each dimension holds equal weight (20%) in contributing to the overall index. The dimension "Use of AI-powered educational tools" has an index of 0.62 for Cluster 1, indicating a moderately successful adoption of AI tools, while Clusters 2 and 3 show slightly lower indices of 0.56. In terms of "Teacher Pedagogical Practices, Creativity, and Critical Thinking," Cluster 1 leads with an index of 0.79, reflecting a strong emphasis on these pedagogical aspects, whereas Cluster 2 (0.63) and Cluster 3 (0.89) exhibit varying levels of engagement with creativity and critical thinking strategies.

The "Teacher Attitudes and Perceptions" dimension reveals a high of 0.70 in Cluster 2, but a concerning drop to 0.38 in Cluster 3, indicating fluctuating perceptions about the effectiveness of AI tools. For "Adaptation to Diverse Learners and Time Efficiency," all clusters demonstrate solid indices, particularly Cluster 3 (0.91), highlighting the potential of AI tools in catering to diverse educational needs. Finally, the "Challenges, limitations, and future improvement" dimension reflects the greatest disparity, with Cluster 1 scoring 0.41 and Cluster 3 significantly higher at 0.73, suggesting that while some clusters recognize substantial challenges, others see potential for improvement. The overall integrated index is 0.66, reflecting a balanced yet cautious approach to AI integration across all dimensions.

3.7.3. Discussion

The analysis of the results provides valuable insights into the implementation of AI tools, particularly Twee, in the EFL teaching environment. The demographic data reveals that the majority of teachers are between the ages of 36 and 50 (47.83%) and primarily reside in Babahoyo (78.26%), suggesting a mid-career teaching workforce with potential familiarity and adaptability to new technological tools (Divekar et al., 2022). The high percentage of teachers with Master's degrees (91.30%) indicates a highly qualified group, which is consistent with findings that suggest advanced degrees correlate with a greater willingness to adopt innovative teaching tools, such as AI (Hwang & Chien, 2022).

When examining the adoption of AI tools, Twee emerged as the most utilized tool, with 100% of participants incorporating it into their classes. This mirrors high adoption rates of AI tools in higher education settings (Popenici & Kerr, 2017). ChatGPT, the second most popular tool, was used by 82.61% of participants, reflecting a growing interest in leveraging generative AI in teaching, such tools enhance teacher efficiency and lesson interactivity. Other tools, like Magic School AI (73.91%) and Zoo Replicate (52.17%), show a wide array of AI applications in the classroom, AI adoption is varied and context-dependent (Junaidi, 2020).

The results also underscore the strengths and weaknesses in integrating AI tools into teaching practices. While teachers showed strong knowledge of AI tools before the training (Cluster 1 scoring 1.00), their ability to integrate these tools into

lesson plans remained low, with a score of only 0.30. Teachers may be familiar with AI tools, they often struggle to translate that knowledge into practical applications, particularly in lesson planning. The difficulty of integrating AI tools is further supported by the relatively high scores for AI usage frequency (0.59 to 0.78) but much lower scores for lesson plan integration, suggesting a gap between AI knowledge and practical implementation (Kumar et al., 2023).

The analysis of the impact of Twee on creativity and critical thinking revealed a significant picture. Clusters 1 and 3 demonstrated higher scores in modifying instructional strategies (1.00), suggesting that Twee can significantly influence teaching approaches. However, the variability in increasing creativity, especially in Cluster 2 (0.18), suggests that while AI tools can enhance certain aspects of teaching, their influence on promoting creativity may not be as uniformly effective (Lindner et al., 2019).

Another critical finding relates to the attitudes and perceptions of teachers toward AI tool performance. While Cluster 2 reported relatively high scores in enhancing engagement (0.70) and creating interactive, dynamic classes (0.70), Cluster 3 showed significantly lower scores (engagement at 0.22), indicating disparities in how AI tools are perceived and utilized. Teacher attitudes toward AI are generally positive, particularly when they see immediate benefits in student engagement. The lower scores in Cluster 3 may reflect contextual or infrastructural challenges, which, according to Bond et al. (2020), can significantly impact the efficacy of AI tools in education (Chen et al., 2020).

The adaptation of AI tools for diverse learners and time management shows promising results, with high scores for providing materials for diverse learners and students with special needs (1.00 across most clusters). AI tools can enhance inclusivity in education by personalizing learning materials for different needs. However, the scores related to saving time during lesson planning (0.56 to 0.76) indicate that while AI tools can reduce workload, there is still room for improvement in optimizing these processes (Wang, 2022).

Finally, the challenges, limitations, and future improvements regarding Twee highlight areas for development. The integration of AI tools was seen as moderately challenging (0.33 to 0.67), with privacy concerns particularly prominent in Cluster 3 (0.78), echoing findings by Selwyn (2019) that privacy and security remain key concerns for educators when adopting AI technologies. Additionally, the perceived limitations of AI in enhancing learning experiences (0.89 in Cluster 3) emphasize the need for ongoing improvement of these tools (Al Braiki et al., 2020).

3.8. Limitations in the study

The present study, while providing valuable insights into the use of Twee as an AI tool in EFL education, is subject to several limitations. First, the sample size of 23 teachers, though sufficient for an exploratory analysis, limits the generalizability of the findings to broader educational contexts. The study's focus on a specific group of EFL teachers from a single institution, CENID at the Universidad Técnica de Babahoyo, may not fully capture the diversity of teaching

experiences, backgrounds, and technological proficiencies found in other regions or educational settings.

Additionally, the relatively short duration of the study—centering on a three-day training session—may not have allowed for a comprehensive evaluation of the long-term impact of Twee on teaching practices and student learning outcomes. Another limitation lies in the reliance on self-reported data, which may be subject to biases such as overreporting of positive outcomes or underreporting of challenges.

Furthermore, the study primarily assessed teacher perspectives and did not include a detailed analysis of student outcomes, which limits the understanding of how AI tools like Twee affect learners directly. Finally, as with any study involving rapidly evolving technology, the findings are time-sensitive, and the capabilities of AI tools, as well as teacher familiarity with them, are likely to change, necessitating ongoing research to track these developments over time.

Conclusions

This study has demonstrated that integrating Twee as an artificial intelligence (AI) tool in the teaching-learning process significantly enhances the pedagogical practices of EFL educators. The participants in the study expressed a positive shift in their teaching methodologies, citing that Twee not only facilitated more engaging classroom experiences but also contributed to more efficient lesson planning and instructional design.

The three-day training on the use of Twee improved teacher confidence in integrating AI tools into their daily teaching routines. Teachers became more adept at leveraging technology to create interactive learning environments, which contrasts with findings by Li et al. (2020), who observed that many teachers struggle with AI implementation due to lack of technical support.

The study revealed that Twee promoteed a sense of collaboration among teachers, particularly in the areas of content creation and knowledge sharing. Teachers frequently mentioned that AI tools like Twee enabled them to collaborate more efficiently, which is consistent with the findings of Xie and Zhong (2022), who highlight the role of AI in promoting collaborative learning environments for both students and educators.

The research emphasized the importance of continuous professional development in AI literacy for teachers. The findings show that while teachers benefited from the training, there is an ongoing need for additional professional development to fully harness the potential of AI in education. The use of Twee not

only enhanced engagement but also contributed to a pedagogical transformation. Educators shifted from teacher-centered approaches to more student-centered, interactive methods, which supports the notion that AI tools can drive pedagogical innovation (Vega & Rodríguez, 2021).

Despite the positive outcomes, the study also identified certain challenges related to technology integration. Some teachers expressed concerns over the reliability of AI tools and the need for consistent technical support. Although the study focused on teacher experiences, the absence of direct assessment of student outcomes limits the understanding of how AI tools like Twee impact learner success. While teachers perceived enhanced engagement and motivation, future studies should investigate how these tools affect student learning, retention, and overall performance. This would provide a more holistic view of the effectiveness of AI tools in education.

Finally, the study underscores the importance of continuous evaluation of AI tools in educational settings. Given the rapid pace of technological advancements, ongoing research is necessary to assess the evolving capabilities of tools like Twee and their relevance in diverse educational contexts. Regular assessment will help educators adapt their teaching strategies to maximize the benefits of emerging technologies.

Recommendations

Based on the findings, it is recommended that institutions expand their training programs to include more extensive modules on AI tools like Twee. The three-day training, while beneficial, should be followed by ongoing workshops to ensure that teachers can fully integrate these tools into their curricula. To address the challenges of technology integration, it is important to establish robust technical support systems within educational institutions.

Teachers expressed concerns over the reliability of AI tools and the need for consistent technical assistance. Therefore, institutions should invest in dedicated technical support teams that can provide immediate assistance to educators facing technological difficulties. This would reduce downtime and increase the overall efficacy of AI tools in classrooms.

Given the success of Twee in promoting collaboration among educators, it is recommended that institutions encourage the use of AI tools to promote collaborative teaching practices. Developing platforms where teachers can share AI-generated resources and exchange best practices would enhance the overall quality of education. Collaborative teaching not only benefits the educators but also creates a more dynamic learning environment for students.

While this study focused on teacher experiences, future research should expand to include detailed assessments of student outcomes. Investigating how tools like Twee impact student engagement, comprehension, and academic performance will provide a more comprehensive understanding of AI's

effectiveness in education. Longitudinal studies, tracking student progress over time, would be particularly valuable in assessing the sustained impact of AI tools.

Future research should also explore how AI tools like Twee perform in diverse educational settings, including schools with limited technological resources. This would help identify the barriers to AI adoption and provide strategies for making these tools accessible to all educators, regardless of institutional limitations. Investigating different socioeconomic contexts will ensure that AI tools are developed and implemented in ways that promote inclusivity.

Researchers should continue to investigate the long-term effects of AI tools on teaching practices and pedagogical transformation. This study highlighted a shift toward student-centered learning, but further exploration is needed to understand how AI tools will shape educational approaches over extended periods. Finally, interdisciplinary research should be promoted to explore the intersection of AI, education, and other fields such as psychology and linguistics. Collaborative efforts among experts in education, technology, and social sciences will be essential for pushing the boundaries of AI integration in education.

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