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عنوان

المذكرة: Artificial Intelligence Application for Learners' Language fluency Enhancement: Case Study of AKLI MOHAND OULHADJ University of Bouira Third Year License Students in the Department of English

التخصص: Didactics and Applied Languages

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Faculty of Letters and Foreign Languages

Department of English Language and Literature

Artificial Intelligence Application for Learners' Language Fluency Enhancement

Case Study of AKLI MOHAND OULHADJ University of Bouira. Third Year License Students in the Department of English

A Thesis Submitted to the Department of English Language and Literature - University of Bouira – in Partial Fulfillment for the Requirement of Master's Degree in

Didactics and Applied Languages

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Dedication

First and foremost, I would like to express my gratitude to Allah S.W.T for giving me wisdom, strength and knowledge when doing this research.

I dedicate this work to the little girl I used to be.

To my parents, my dearest father, my first love, my hero who wiped my tears at my lowest, and the hand who helped me up when the world bushed me down.

My beloved mother, my source of comfort, my light in darkness and my shoulder to cry on. The one who has been with me in every step of my life.

A special thanks to you for always supporting my dreams.Your endless love, hugs, pray and smiles kept me going.

To my dear brothers, I am deeply grateful for the constant support you were always showing.

To my supervisor Dr. Djadi Sara for her patience and great guidance in helping me realize this academic dream.

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To my dear family, and special names in my life.

And finally, to my partner Lynda for being by my side along this path.

Chami Ouafaa

Praise be to Allah, by those grace achievements are realized.

I dedicate this humble work to my pure angel, and my strength after Allah. To my first supporter, my dear mother, and the candle of my life who lit my path with her prayers.

To the one who supported me without limits and gave me without expecting anything in return, my dear father.

To the one who taught me the meaning of perseverance and never giving up. Who extended his hand without getting tired or bored in my weakness, thank you for being there for me whenever I needed you my brother Mustapha.

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I dedicate it to my friend Ouafa, the one who shared this work with me, thank you for your understanding and for being by my side.

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May God bless you all.

Abstract

This thesis is an attempt to investigate the use of AI tools to facilitate the development of learners' speaking fluency skills. This study aims to explore different objectives including students' attitudes regarding AI use in improving speaking skill. It delves into the challenges and difficulties faced by learners in their improvement process, in addition to the role of AI apps as a new trend in enhancing learners speaking fluency. To achieve this, a mixed methods approach was employed in this exploratory research to combine both qualitative and quantitative data for a holistic understanding of the topic. For data collection method, it involved purposively distributing a questionnaire to the first group students of third-year license in the department of English along with a focus group semi-structured interview that involved 8 randomly chosen students from the same group. A pre and post test was established to measure and compare learner's fluency before and after an AI tool usage period of time. Data were analyzed using three statistical techniques which are descriptive, comparative and inferential. According to the obtained results, AI apps showed their effectiveness indicating that they can slightly enhance learners' speaking fluency by providing personalized learning experience that matches individuals' needs, and immediate feedback in addition to continuous practice to develop communicative competence.

Key words : artificial intelligence (AI), Language learning, speaking fluency, AI powered tools, oral proficiency.

الملخص:

تهدف هذه الأطروحة لدراسة استخدام أدوات الذكاء الاصطناعي لتسهيل تطوير مهارات التحدث بطلاقة لدى المتعلمين. تسعى هذه الدراسة إلى استكشاف أهداف مختلفة، بما في ذلك موقف الطلبة تجاه استخدام الذكاء الاصطناعي في تحسين مهارة التحدث. كما ترمي هذه الدراسة إلى التعمق في التحديات والصعوبات التي يواجهها المتعلمون في عملية تطوير فصاحتهم بالإضافة إلى دور تطبيقات الذكاء الاصطناعي كتوجه جديد في تعزيز طلاقة المتعلمين في التحدث. ولتحقيق ذلك، تم استخدام نهج مختلط في هذا البحث الاستكشافي للجمع بين البيانات النوعية والكمية لفهم شامل للموضوع. أما بالنسبة لطريقة جمع البيانات، فقد تضمنت توزيع استبيان بشكل مقصود على طلاب المجموعة االفوج الاول من السنة الثالثة في قسم اللغة الإنجليزية. بالإضافة إلى مقابلة شبه منظمة لمجموعة تركيز شملت سبع طلاب تم اختيارهم عشوائيًا من نفس المجموعة كما تم الاعتماد على اختبار قبلي وبعدي لقياس ومقارنة تطور المتعلمين قبل وبعد فترة استخدام أدوات الذكاء الاصطناعي. حُلّلت البيانات باستخدام ثلاث تقنيات إحصائية: الوصفية والمقارنة والاستدلالية. ووفقًا للنتائج المُتحصل عليها أظهرت تطبيقات الذكاء الاصطناعي فعاليتها، مما يشير إلى قدرتها على تحسين طلاقة التحدث لدى المتعلمين بشكل طفيف من خلال توفير تجربة تعليمية شخصية تُلبي احتياجات الأفراد، والمراجعة الفورية، بالإضافة إلى التدريب المستمر لتطوير الكفاءة التواصلية .

الكلمات المفتاحية: الذكاء الاصطناعي، تعلم اللغة، طلاقة التحدث، أدوات مدعومة بالذكاء الاصطناعي، الكفاءة الشفهية.

List of abbreviations

AI: Artificial Intelligence.

L2: Second Language.

FL: Foreign Language.

EFL: English as a Foreign Language.

EAP: English for Academic Purposes.

SLA : Second Language Acquisition.

Q : Question.

H: Hypotheses.

CLT: Communicative Language Teaching.

TBLT: Task Based Language Teaching.

GDPR: General Data Protection Regulation.

MIT: Massachusetts Institute of Technology.

NLP: Natural Language Processing.

ML: Machine Learning.

ESL: English as a Second Language.

IPAs: Intelligent Personal Assistants.

SALL: Self-access Language Learning.

ASR: Automatic Speech Recognition.

CALL: Computer-assisted Language learning.

call: intelligent Computer-assisted Language Learning.

LSTM: Long Short Term Memory.

BERT: Bidirectional Encoder Representations from Transformers.

CAPT: Computer-assisted Pronunciation Training.

AI-SRT: AI powered Speech Recognition Technology.

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General Introduction

Introduction

English language has historically established itself as the global lingua franca. In today's globalized world, it has become the dominant medium of international communication, serving as a bridge connecting people from various backgrounds and playing a crucial role in business, science, technology and education. It is not only considered as a tool for information exchange but also a gateway and often a key requirement to both academic success and professional development. Consequently, English language proficiency—especially speaking fluency—has become a top priority in language learning curricula across the globe. Hence people from non-native countries such as Algeria are keen to enhance their English language abilities, especially speaking as it is one of the core competencies in second language acquisition (SLA) enabling individuals to engage in conversations, express their thoughts and ideas and meaningfully interact with others. Speaking fluency is considered the most complex and challenging skill to be improved as it requires a serious and continuous practice, in addition to a grammatical and lexical knowledge along with real time processing. Despite the increasing emphasis on English language in higher education in Algeria, learners in universities still struggle with improving their speaking fluency for many reasons, not only because of the limited exposure to language and the authentic English-speaking material, but also to the educational system which has previously focused on French as a primary foreign language, in addition to traditional classroom settings and teaching methods that prioritized grammar over speaking skill which was given a less importance. These challenges hinder learners' ability to communicate effectively and limit their improvement chances. However, they made efforts to increase their speaking abilities. They have first relied on traditional methods like language classes and textbooks. While these methods were successful to an extent, but it does not always provide the dynamic and personalized feedback needed for a significant enhancement. In recent years, several technological advancement and artificial intelligence tools appeared and entered the field of education as a game changing offering innovative solutions to reshape traditional teaching and learning methods enabling for personalized learning experience. The integration of AI into English language education offers new possibilities for enhancing speaking fluency, especially where traditional teaching methods may not be sufficient. AI technologies including chat bots, AI-powered language learning applications, intelligent tutoring systems, and virtual speaking assistants have shown their great capacity in offering different speaking practice, simulating interactive conversation, and delivering immediate personalized feedback by analysing the

speech and providing correction and guidance, makes it a powerful instrument in enhancing learners' speaking fluency. Its results are incomparable with the ones presented by traditional methods.

1. Statement of the problem

Developing a foreign language speaking fluency presents a significant challenge for users specially in non-native countries, the case of Algeria. Many university students struggle to enhance their oral communication skills which presents a serious problem in our classrooms, many students can not effectively use English for more than few minutes. This is caused by several factors, linguistics difficulties such as limited vocabulary, lack of grammar accuracy and pronunciation problems are common reasons across diverse EFL contexts. Phsychological barriers including anxiety, lack of confidence and shyness inhibit learners' willingness to get involved in oral communication (Sharma, 2024; Jamoom & Bahron, 2024).Furthermore, the large class size hinder teachers to manage all the group, they face difficulties in providing personalized experience and feedback for all students limiting them to develop their speaking abilities specially when the time deduced to language speaking tasks is not sufficient, in addition to the limited exposure to authentic English input and limited opportunities for interaction. In light of these challenges, the integration of artificial intelligence can provide alternatives and solutions to solve learners struggle in expressing themselves proficiently in English. Its capacities suggest that it could play a crucial role in addressing these challenges. Consequently, studying the potencial of AI in enhancing learners' speaking fluency is essential to provide alternatives and overcome the limitations of traditional teaching and learning methods to support effective communication.

2. Aims and significance of the study

The inability of learners in Algerian universities to speak English fluently is a pressing problem in modern education. Being a fluent speaker is very essential for academic success and professional advancement. This research addresses a critical need in learning English which is artificial intelligence that can help learners in improving their speaking abilities and becoming competent speakers.

Artificial intelligence has the potential to revolutionize language learning by providing interactive learning experience. AI platforms can offer various resources that emphasis on pronunciation, grammar, vocabulary usage and conversational practice. These resources and websites can be adapted according to individual learner needs , providing a feedback that fill in gaps of their knowledge, and increase their linguistic input to produce more accurate and fluent language output, which opens up a wide range of opportunities in both academic and professional world. The research at hand aims to contribute to the field of technology enhanced language learning through its focus on the effect of AI tools in enhancing speaking fluency to empower Algerian University learners by leveraging AI technology to bridge the gap in English fluency. In addition, to addressing English fluency paucities among second group students of the third-year license in Bouira University. The study explores the extent to which AI-based applications can substitute for in-class speaking activities.

3. Research questions and hypothesis

Throughout this research we will attempt to investigate the intelligent learning environment in speaking classroom : AI applications for learner's language fluency Enhancement. We raise the following questions :

Q1: What are the reasons behind the difficulties faced by learners in speaking English fluently?

Q2: What are the attitudes of second group students of third-year license in Bouira University regarding the use and integration of AI apps in their learning process ?

Q3: To which extent AI technologies are effective in speaking fluency enhancement ?

Q4: Can AI based apps replace traditional speaking practice in the classroom ?

The following hypotheses have been suggested to answer the previously mentioned research questions:

H1: Englsih fluency paucities among learners may be caused by a lack of practice, desire or exposure to vocabulary and grammar knowledge. In addition to the educational curriculum that does not give speaking skill the needed importance.

H4: AI driven tools cannot replace speaking classroom activities with the teacher. However, it is a useful way for fluency improvement.

4. Research Techniques and Methodology

Our research is concerned with investigating the effectiveness of AI in enhancing speaking fluency. Since we are in university environment, we chose firdt group students of the third year level in the department of English at Akli Mouhand Ouladj, University of Bouira as a sample. As a research design, a duo of case study and focus group are used. The study adopts a mixed methods approach for a thorough understanding by combining both qualitative and quantitative methods to analyze the data gathered. The data collection instruments utilized in this study are a questionnaire coupled with a semi-structured interview to gather students' attitudes and perceptions towards the use of AI and their personal experiences, in addition to learners speaking performance assessment to measure their improvement and level before and after using AI app. The collected data are analyzed using descriptive, comparative and inferential statistics for the quantitative data and qualitative content analysis for qualitative data.

5. Structure of the Dissertation

The dissertation follows a simple traditional structure, containing general introduction, three chapters and general conclusion. The general introduction outlines the statement of the problem, research aims and significance, research questions and hypotheses, research techniques and methodology, as well as the dissertation`s organizational framework. The first chapter is a literature review which provides an in-depth body of knowledge exploring the main ideas related to the topic. The second chapter entitled research design and methodology deals with the followed procedures of data collection and analysis. The third chapter presents the data obtained through data collection instruments in a detailed way along with analysing and discussing the results to provide concrete answers to the questions mentioned in the introduction aiming to verify whether the hypothesis is valid through either confirming or refuting it. The general conclusion provides a summary and a recapitulation of the whole work, including recommendations and limitations of the research.

Chapter One: Literature Review

Introduction

This chapter deals with the literature review, it explores a growing body of research about the role of AI in supporting learners' speaking fluency. The review is organized into four key sections to provide a comprehensive analysis. Theories of second language acquisition (SLA) are examined in the first section, which offers a variety of traditional and modern viewpoints on how learners acquire a second language. In order to provide a theoretical framework for comprehending language learning processes, this section addresses a variety of ideas, including interactionist, cognitive, and sociocultural perspectives.

Examining pedagogical approaches and instructional strategies that have historically been used in language classes, the second section focuses on conventional techniques for improving speaking fluency. This covers methods including task-based learning, role-playing, communicative language instruction, and repetition drills, emphasizing both their advantages and disadvantages in terms of improving students' speaking abilities.

The third segment examines the expanding corpus of research on AI in education. It focuses on how artificial intelligence (AI) is revolutionizing teaching and learning. It talks about its possibility in providing a customized learning environment, the pedagogical ramifications, and how AI technologies are being incorporated into different educational contexts. The last section focuses on AI tools designed especially for language learning, including programs like chat bots, speech recognition softwares, intelligent tutoring systems, and adaptive language learning platforms. The benefits and drawbacks of AI-enhanced language acquisition are also discussed in this section, with a focus on speaking fluency improvement.

Using this systematic review, the chapter intends to identify gaps that the research attempts to fill. The integration of artificial intelligence (AI) in language learning has attracted significant attention, particularly in its impact on enhancing speaking skills among second language (L2) learners. AI technologies, including speech recognition tools, intelligent tutoring systems, and conversational agents, have shown notable potential in supporting learners' oral communication development.

Research highlights that AI-assisted environment can foster more extended learner interactions compared to traditional human-peer exchanges, leading to improved speaking

proficiency (Hill, Ford, Farreras, 2015; Kang, 2022). These studies demonstrate that AI tools facilitate real-time, adaptive, and individualized language practice, thereby improving features such as fluency, grammatical accuracy, lexical range, and pronunciation (Junaidi, 2020). For instance, Qassrawi et al. (2024) found that using Google Assistant significantly enhanced EFL students' speaking fluency, offering benefits such as increased language exposure, learner engagement, and self-directed learning opportunities. Similarly, Dennis (2024) confirmed the effectiveness of AI-powered speech recognition technologies in improving English pronunciation and speaking fluency, further supported by learners' positive perceptions of these tools.

The value of personalized feedback in AI learning platforms has also been emphasized. He et al. (2024) reported that the EAP Talk platform, an AI-based speaking tools, enhanced speaking fluency, grammar, vocabulary, pronunciation, and organization of ideas while boosting learner confidence through individualized feedback. Macias et al. (2024) highlighted that AI technologies, such as speech recognition software and chat bots, offer realistic conversational practice and promote oral fluency, particularly among introverted learners. Moreover, Al-Shallakh (2024) noted that AI applications like Elsa Speak provide real-time feedback and foster autonomous learning through repeated practice, which directly contributes to improved pronunciation and speaking fluency.

1. Theories of Second Language Acquisition

These empirical findings can be better understood through the lens of Second Language Acquisition (SLA) theories. Krashen's Input Hypothesis posits that learners acquire language through comprehensible input slightly beyond their current proficiency level, a principle reflected in AI's ability to deliver tailored, level-appropriate input (Chen et al., 2024). According to Chen et al. (2024), this hypothesis emphasizes understanding over production, suggesting that input- rich environment fosters natural language development. However, critics argue that Krashen's theory downplays the significance of language output and interactive communication in acquisition (McLaughlin, 1987; Pauzan, 2024).

Addressing these limitations, Swain's Output Hypothesis stresses the importance of language production—through speaking and writing—as a tool for learners to notice gaps in their linguistic knowledge and engage in metalinguistic reflection (Sales, 2020; Hu; Xu, 2015).

This theory finds support in AI tools that enable learners to produce language and receive corrective feedback, facilitating active engagement and self-monitoring (Peker; Arslan, 2020). Lin (2012) adds that language output not only reinforces structural knowledge but also enhances writing skills and learner motivation. Yet, some scholars argue that output alone is insufficient for language development without meaningful interaction and feedback (Gass; Mackey, 2007).

2. Factors Affecting Speaking Fluency

While SLA theories offer valuable frameworks for understanding AI's pedagogical implications, speaking fluency remains influenced by various internal and external factors. Language exposure, pedagogical approaches, learner's motivation, and psychological variables play critical roles. Tran et al. (2024) identified English exposure, supportive learning environments, motivation, and effective teaching pedagogy as key components in developing speaking fluency. Rana (2024) emphasized that limited language exposure, inadequate instructional practices, insufficient teacher training, and socio-economic constraints hinder oral proficiency development. Psychological factors such as anxiety and fear of speaking further affect learners' fluency, as noted by Houn and Em (2022).

3. Traditional Teaching Methods for Enhancing Speaking Fluency

Traditional language teaching methods have long been employed to enhance speaking proficiency. However, their effectiveness is increasingly scrutinized. Subash and Lowrencia (2024) critiqued traditional practices such as rote memorization, drills, and formal presentations for being rigid and disengaging. The grammar-translation method, while useful for vocabulary and grammar acquisition, fails to support communicative competence and fluency (Naghiyeva, 2024). Romsi et al. (2023) argued that classroom-based, teacher- led approaches often limit exposure to authentic speaking contexts. Zuo (2024) suggested that interactive, activity-based strategies like role plays and group discussions are more effective in improving speaking skills among adult learners.

Innovative pedagogical models such as Communicative Language Teaching (CLT) and Task-Based Language Teaching (TBLT) prioritize real-life language use through communicative tasks, enhancing learners' fluency and engagement (Galeano Herrera et al., 2024). These approaches align well with AI-supported instruction, which offers personalized,

interactive, and learner-driven learning experiences. Thus, the integration of AI can complement and, in some cases, surpass traditional methods in promoting speaking fluency. Despite the promising potential of AI in language education, several limitations and gaps persist in the existing research. Many studies lack longitudinal data to evaluate the long-term effects of AI tools on language development.

Furthermore, inconsistencies in research findings highlight the need for more rigorous empirical investigations. Individual learner differences, including age, technological proficiency, and learning styles, may affect the effectiveness of AI-based instruction, necessitating more personalized and inclusive approaches. Additionally, while SLA theories support AI-assisted learning in principle, further theoretical refinement is required to account for the complex dynamics of human-AI interaction.

Synthesizing these insights, it becomes evident that AI tools, when integrated within established SLA frameworks, can significantly enhance speaking fluency. AI facilitates both input and output processing, promotes interaction, and provides individualized support—factors that are central to successful language acquisition. Nevertheless, optimal language learning outcomes are most likely achieved through a balanced integration of AI-enhanced instruction and communicative pedagogy. Future research should focus on examining the comparative efficacy of AI and traditional methods, investigating the longitudinal impact of AI interventions, and exploring how AI technologies can be adapted to diverse learner contexts to address persistent challenges in developing speaking fluency.

4. Definition and Types of AI

Artificial Intelligence (AI) which is a specialized branch of computer science is in fact dedicated to the development of machines that replicate human cognition and behavior (Russell &Norvig, 2021). Its intellectual roots trace back to the work of the British mathematician and philosopher Alan Turing whose seminal essay *Computing Machinery and Intelligence* (1950) laid the foundational questions concerning the possibility of creating intelligent machines capable of human-like thought.

The term “Artificial Intelligence” was formally coined in 1956 by John McCarthy who is widely recognized as the father of AI, during a very important workshop held at the

Massachusetts Institute of Technology (MIT). McCarthy (2007) characterized AI as "the science and engineering of making intelligent machines, especially intelligent computer programs," a definition that accentuates the field's dual nature: it is both theoretical and practical, hence it bridges scientific inquiry and technological applications to produce systems that can learn, adapt and reason similarly to humans. In this context, Copeland (2023) further affirms that AI embodies the computational realization of human faculties such as problem-solving, comprehension, decision-making and learning.

AI can thus be regarded as an interdisciplinary theory devoted to designing intelligent systems capable of executing tasks traditionally dependent on human intellect. Its vast scope includes cutting-edge technologies such as machine learning, deep learning and natural language processing (Coursera Staff, 2024) with each contributing uniquely to the realization of artificially intelligent agents.

Significant figures in the history of AI, such as Marvin Minsky, have reinforced this view. Indeed, Minsky (1968) whose work advanced AI considerably (Redillas, 2023), defined the field as one aimed at constructing machines able to carry out operations that would require intelligence were they performed by human beings (as cited in Marsden, 2017). In essence, AI is a systematic endeavor to replicate human mental capabilities through computational means.

As AI continues to evolve, its influence across sectors becomes increasingly pronounced. Within this regard, Li et al. (2018) emphasize the transformative role of smart technologies including AI-driven systems which are steadily reshaping societal norms and practices. According to Li et al. (2018, as cited in Limna et al., 2022) AI has become an essential aspect of contemporary life driving and resulting in major developments in industries ranging from healthcare to finance and most notably education.

Indeed, in educational contexts, AI has risen to prominence among policy-makers and teachers alike most likely due to its innovative solutions that cater to individualized learning needs. According to CAFE (2024), AI is revolutionizing traditional teaching paradigms through data-informed algorithms that track student performance and adjust instructional strategies accordingly. This shift from standardized to personalized education is echoed in the findings of Altun (2015), whose research on technology integration in foreign language education

demonstrated that technology-enhanced instruction significantly augments language acquisition when used alongside conventional pedagogical methods.

AI's versatility is further highlighted by its core subfields including expert systems, natural language processing (NLP) and machine learning (ML). Expert systems, once heralded in the 1980s as the vanguard of intelligent computing are engineered to emulate the decision-making processes of domain-specific human experts. Within education, such systems offer strategic support for courses advising and academic counseling. For instance, Alsubait et al. (2014) developed a recommendation system that assists university students in selecting courses aligned with their academic history and preferences. Similarly, El Mawas et al. (2023) proposed an AI-driven guidance system tailored to high school students helping them make informed academic decisions based on total profile analyses. These applications exemplify how expert systems contribute to a more customized and supportive educational experience.

Natural language processing, another critical subdomain of AI, fuses computational techniques with linguistic theory to facilitate the automated understanding and generation of human language. NLP is concerned not only with text but also with spoken language although speech processing is sometimes treated separately. According to Meurers (2020), NLP constitutes the practical application of computational linguistics, an interdisciplinary domain situated at the intersection of linguistics, computer science and psychology aimed at modeling and processing language in both analytical and functional contexts.

Complementing these subfields is machine learning, the mechanism through which AI systems gain the capacity to learn from experience. Alpaydin (2014) describes ML as a process whereby computers are programed to optimize performance using past data or experiential input. This capability enables breakthroughs in various domains including visual recognition, speech interpretation and robotic behavior. For AI to operate effectively in tasks like NLP, it must rely on structured, categorized datasets derived from real-world examples thereby allowing for meaningful pattern recognition and decision-making.

5. AI Applications in Education

Needless to say, artificial intelligence is revolutionizing the educational field by introducing a suite of groundbreaking tools such as intelligent tutoring systems, automated

assessment technologies and adaptive learning environments. As a matter of fact, these innovations are redefining pedagogical practice by tailoring educational experiences to individual learner profiles which leads to enhancing both the efficacy and inclusivity of instruction. So, AI enhances learning by algorithmically personalizing its pace, content and delivery consequently adapting to the varied cognitive needs and learning paths of individuals.

In the domain of language acquisition, AI-powered applications harness the capabilities of natural language processing (NLP) and speech recognition to support learners in refining their pronunciation, mastering grammatical structures and achieving greater fluency. Beyond question, conventional language instruction frequently falls short in delivering the kind of immediate and individualized feedback required to correct entrenched pronunciation habits, the thing that poses a persistent barrier to oral proficiency. On the contrary, artificial intelligence addresses this pedagogical shortcoming by delivering instantaneous data-informed feedback on the major phonological features such as intonation, stress patterns and rhythm which enables more precise and measurable improvement in speech performance (Levis, 2018).

Beyond corrective feedback, AI also constructs immersive and interactive communicative environments that emulate authentic conversational contexts which are settings that are often difficult to recreate within the constraints of traditional classroom dynamics. In consequence, these simulated dialogues foster spontaneous language use all while bridging the gap between theoretical knowledge and practical application (CAFE, 2024).

As AI technology continues its rapid advancement, its influence within educational systems is poised to deepen further. Incontestably, AI is reshaping contemporary education by bridging learning disparities and enabling active learner-centered experiences through intelligent instruction, automated evaluation, and adaptive pedagogy all while creating a future where education is more accessible, interesting and effective for students worldwide.

6. The Significance of Pronunciation and Fluency in Communication

Speaking proficiency lies is the essence of effective communication in English as a foreign language (EFL) and English as a second language (ESL) education. Within this domain pronunciation plays a major role serving as the foundation for clarity and mutual understanding in verbal interactions. Equally, fluency which is the ability to communicate smoothly and

naturally free from significant pauses ensures that learners can participate confidently and competently in dialogues. Together, the mastery of pronunciation and fluency is indispensable for articulating ideas and engaging in academic or professional discourse.

With this regard, AI-powered tools are uniquely poised to address the challenges associated with pronunciation and fluency through advanced technological solutions. Correspondingly, a variety of AI-driven technologies are available to support language acquisition (Pokrivčáková, 2019). Among these, Intelligent Personal Assistants (IPAs), chat bots, and language learning applications are the most widely utilized and frequently cited in the research literature. IPAs, in particular, transcend traditional classroom environments to offer learners flexible means of practice. Hence, these assistants typically serve as multifunctional tools designed to assist with a range of tasks, such as converting speech into text, retrieving information and articulating responses in a human-like manner, thereby making IPAs support pronunciation practice as an added feature.

In like manner, Moussali and Cardoso (2020) stress the critical role of IPAs in fostering learner autonomy, self-access language learning (SALL) and also motivation. Since these tools usually furnish the learners with an ample of opportunities to interact independently consequently providing continuous engagement even in the absence of native speakers.

By the same token, Chatbots represent another significant advancement in AI-driven language learning (Coniam, 2014). Assuredly, these software applications facilitate interactions with users via text or voice thereby simulating human conversation by posing questions and offering responses (Bibauw et al., 2019). A notable example is Duolingo which is a widely used language-learning platform that employs AI algorithms to offer personalized feedback and instruction. Through its interactive lessons and quizzes, Duolingo tailors the learning experience to the individual needs of its users. Another example is ELSA Speak which is a mobile application designed to enhance English pronunciation. ELSA Speak employs speech recognition technology to analyze users' speech patterns in real-time and then provides constructive feedback and suggestions for enhancements (Wang et al., 2021).

Besides, AI-powered catboats like their predecessors ELIZA usually engage in natural language processing to interact with users with an aim of fostering conversation practice and learning (Schmulian& Coetzee, 2019. Within the educational sphere, chat bots are instrumental

in promoting learner motivation by offering guidance and supporting classroom management (Carayannopoulos, 2018). They are commonly employed to facilitate daily conversations, respond to learners' inquiries and conduct assessments consequently enriching the overall learning experience (Chiu et al., 2023).

7. AI Technologies for Language Learning

7.1. Speech Recognition and Acoustic & Language Modeling

Artificial Intelligence (AI) is transforming language acquisition particularly through advancements in speech recognition systems that enhance both pronunciation and fluency. With this regard, automatic speech recognition (ASR) represents an important AI technology enabling machines to comprehend and transcribe spoken language into text (Daniels &Iwago, 2017). It is widely integrated into voice recognition systems, intelligent personal assistants (IPAs), automatic transcribers and note-taking applications, thus it has witnessed substantial improvements over the past decade with an aim of achieving higher accuracy and broader applicability (Evers & Chen, 2022).

Correspondingly, a crucial aspect of ASR is the acoustic modeling which captures the myriad variations in sound and maps them onto corresponding phonetic representations. Complementing this, language modeling predicts and recognizes words by identifying linguistic patterns thereby enhancing ASR’s ability to process speech in diverse accents and under varied speaking conditions (Wahid et al., 2020).

In terms of computer-assisted language learning (CALL), ASR has proven particularly influential with numerous studies accentuating its positive impact on foreign language (FL) acquisition (Ahn & Lee, 2016; Chen, 2011; de Vries et al., 2015; van Doremalen et al., 2016). Indeed, IPAs such as Alexa and Google assistant have become indispensable tools providing learners with real-time conversational practice that sharpens both pronunciation and listening proficiency (Dizon, 2020). Hence it is through immediate and autonomous feedback that learners benefit from ongoing corrective support which fosters pronunciation improvement and alleviates anxiety within language learning environments (Tai & Chen, 2023).

Furthermore, ASR-integrated applications embedded in messaging platforms, websites and learning portals usually offer immediate feedback which further enhances pronunciation

(McCrocklin, 2016). In this context, Bashori et al. (2022) demonstrated that learners utilizing ASR-based EFL platforms exhibited marked improvements in both pronunciation and vocabulary retention. Additionally, peer-assisted learning facilitated through tools like Speech Notes has also been shown to be effective in enabling learners to identify and repair their pronunciation mistakes (Evers & Chen, 2022). So, clearly, as ASR and machine learning models continue to evolve, their effectiveness in language learning grows all while reinforcing ASR's value as an indispensable tool in personalized and interactive education (Moussalli & Cardoso, 2020).

7.2. Applications in Pronunciation Training and Fluency Assessment

Artificial Intelligence (AI) has increasingly become important in modern educational practices particularly within second language acquisition. Building upon earlier advancements in intelligent computer-assisted language learning (iCALL) AI's integration into language instruction offers major enhancements especially in the areas of pronunciation training and fluency assessment (Schulze, 2008). Since AI includes sophisticated speech recognition technologies to deliver immediate actionable feedback on learners' spoken language performance (Dizon, 2020). For instance, learners can use speech evaluation systems to record their vocalized responses on various devices, such as computers or mobile phones and receive evaluations that measure pronunciation accuracy, fluency, and intonation. This real-time feedback equips learners with the ability to identify and address pronunciation errors which makes AI-driven tools indispensable in supplementing traditional classroom methodologies (Hellmich&Vinall, 2021).

Beyond individual pronunciation correction, AI contributes significantly to fluency development by creating active interactive speaking environments. Applications powered by AI, including chat bots, voice assistants, and speech recognition tools, facilitate real-time conversational practice, thereby enabling learners to refine their understanding of stress, rhythm, and intonation patterns within a low-stress, self-paced context (Zou et al., 2023b). Empirical research has demonstrated that such AI-facilitated social interactions foster more organic, sustained speaking practice, ultimately enhancing learners' fluency and overall communicative competence (Xu et al., 2021). Furthermore, AI's ability to personalize learning experiences by tailoring feedback to the specific needs of each learner facilitates independent

and autonomous practice allowing learners to hone their pronunciation and fluency skills according to their individual learning trajectories (Dizon, 2020) .

7.3.Sentiment Analysis for Feedback on Language Production

Student feedback is significant in ensuring quality assurance within higher education since it helps in evaluating and reflecting on the effectiveness of teaching, the relevance of curricula and the performance of institutions. With this concern, Richardson (2005) asserts that feedback is a critical foundation for identifying strengths and weaknesses in academic programs since it enables institutions to implement targeted improvements. However, despite its significance, the manual analysis of student feedback can be highly subjective time-consuming and prone to inconsistencies which necessitate the adoption of automated approaches.

In addressing these challenges, Singh et al. (2021) demonstrated the efficacy of sentiment analysis in interpreting student perceptions by categorizing feedback into positive, negative and neutral sentiments. Their study showcased how sentiment trends could guide decision-making processes in educational institutions. Similarly, Ghosh et al. (2019) employed sentiment analysis to evaluate online course reviews which ultimately revealed that machine learning models are capable of efficiently processing large datasets and identifying recurring themes. Within this regard, the evolution of natural language processing (NLP) techniques have considerably enhanced the accuracy of sentiment analysis. Also, it is noteworthy that early studies primarily relied on lexicon-based methods which were often insufficient for capturing the different sentiments such as sarcasm or mixed emotions (Liu, 2012).

Recent advancements in deep learning models including long short-term memory (LSTM) networks and bidirectional encoder representations from transformers (BERT) have effectively addressed these shortcomings. For instance, Devlin et al. (2019) demonstrated that BERT outperformed traditional models by better capturing context and subtle semantic variations in text. In another instance, Hasan et al. (2020) emphasized the necessity for multilingual sentiment analysis models to accommodate the diverse linguistic backgrounds of student populations. Furthermore, Alharbi and Alshehri (2022) accentuated the main ethical considerations all while highlighting the need for data anonymization and informed consent to ensure compliance with data protection regulations. Also, Kaur and Saini (2020) proposed a framework for real-time sentiment analysis enabling institutions to promptly address student

concerns. Their findings indicated that automated feedback systems could enhance responsiveness, increase student satisfaction and foster a culture of continuous improvement.

7.4.Pronunciation and Speaking Skills in Language Learning

It is quite evident that mastering pronunciation is essential for effective communication in a second language. Studies draw attention to the necessity of incorporating teaching of pronunciation, which includes elements such as individual sounds, intonation patterns and speech flow within language teaching programs to develop well-rounded oral abilities (Kang, 2016; Major, 2016).

Research conducted by Munro and Derwing (2016) and Saito and Lyster (2019) showed that phonetic training, activities that emphasize linguistic form, and constructive correction are key components in improving speech pronunciation. Furthermore, Thomson (2018) highlighted the need for dedicated instruction for educators in the art of teaching pronunciation, while also advocating for the integration of effective pronunciation instruction techniques into language education programs to aid in more successful language learning and oral proficiency. Bohn and Munro (2020) delved into the difficulties that arise in learning how to pronounce words in a second language, shedding light on the obstacles students encounter and the targeted instruction needed to surmount them. Trofimovich and Isaacs (2019) argued for an increased emphasis on pronunciation within language teaching to enhance communicative skills. In addition, Zhang and Wei (2019) explored how second language acquisition, speaking abilities, and learner anxiety are interrelated, suggesting that fostering a relaxed learning environment can boost speech development.

The collective findings of these studies make a compelling case that the role of pronunciation in language learning is essential and critical and requires personalized teaching strategies that build student confidence and skill. Besides, recognizing the emotional aspects of language learning, such as anxiety, is also important in crafting an educational setting that addresses personal learning hurdles and also advances language fluency.

7.5.Technology-Assisted Pronunciation and Speaking Training

While, pronunciation is essential to language learning, its instructions require overcoming logistical and learner-related obstacles. Therefore, recent studies have shown a

growing endorsement for the use of technology in the teaching of pronunciation and speaking skills for language learners. Research conducted by Morris (2020), Garca-Sánchez and colleagues (2020), and Liao and Xue (2019) have revealed the positive effects of artificial intelligence (AI) and Computer-Assisted Pronunciation Training (CAPT) in advancing learners' abilities to pronounce accurately and speak more proficiently. These technological tools, especially noted for their role in the betterment of vowel sounds and general spoken language performance, showcase the benefits of integrating digital aids into language education. However, the success of technology-assisted pronunciation and speaking training is influenced by a variety of factors. Chen and Duan (2020) and Zou and colleagues (2021) highlighted the critical role of learner motivation, engagement and individual learning differences in the efficacy of these programs.

The literature reviewed herein supports using AI to improve language learning pronunciation. However, a thorough analysis reveals that their efficacy depends on various factors. These factors include software quality, training program design, integration into curricula and adaptability to diverse learner needs and styles. Hence, personalized systems require resources and learners and teachers may have different technological skills. Although technology provides consistent feedback, it may lack the detail of human instructors. So in order to improve language acquisition, technology-based language must be carefully weighed against individual variations, learner attitudes and teachers responsibilities as well.

7.6.AI-Powered Speech Recognition Technology for Language Learning

The burgeoning field of AI-powered speech recognition technology (AI-SRT) has demonstrated the transformative potential for language acquisition presenting an array of significant advantages that extend across pronunciation enhancements, fluency development, and the alleviation of language learning anxiety. Within this regard, research consistently has scored the efficacy of these technologies in advancing learners' spoken language skills. For instance, Li and Li (2021) firmly established that AI-driven language learning tools notably enhance pronunciation capabilities by enhancing precise and authentic sound production. Similarly, Zhao et al. (2021) in their meta-analysis affirmed the substantial impact of AI-assisted tools not only improving pronunciation accuracy and fluency but also mitigating learners' anxiety in second language acquisition contexts.

Similarly, concerning the mobile learning applications, Yalcin and Korkmazgil (2021) demonstrated the significant efficacy of an AI-enhanced mobile application in improving English pronunciation among English as foreign language (EFL) learners. Moreover, Kim (2019) found that personalized AI-based pronunciation lessons facilitated remarkable advances in the English pronunciation of Korean EFL students thereby highlighting the adaptability of AI systems in catering to diverse linguistic backgrounds. The work of Fan et al. (2019) further corroborated these findings by revealing improvements in the spoken English abilities of Chinese EFL learners through the integration of AI technology. Together, these studies point to the impressive and significant role of AI-powered speech recognition systems as indispensable tools for enhancing the pronunciation of language learners across varied contexts worldwide.

However, despite the promising outcomes, a critical analysis of the existing literature reveals several areas warranting further investigation particularly in refining the subtle complexities of AI-driven speech recognition and its adaptability to diverse linguistic and cultural differences.

Conclusion

This literature review outlined the key concepts related to the subject of our research, with a focus of investigating the effectiveness of AI driven tools in enhancing speaking fluency. Additionally, it surveys the existing body of research. The next chapter will focus on the design and methodology of the study.

Chapter Two:

Methodology and Research design

Introduction

This methodology chapter presents a rigorous research framework designed to investigate the transformative potential of artificial intelligence in enhancing English-speaking skills among third-year language learners. The research approach is grounded in contemporary educational technology and second language acquisition theories, aiming to provide empirical insights into AI-assisted language learning methodologies. This chapter outlines the design and methodology of the study as well as the methods used for data collection and analysis. The research questions and hypotheses mentioned in the general introduction are also attempted to be addressed.

1. Reasearch Methodology

1.1.Interpretive Research Paradigm

The study adopts an interpretive research paradigm, which aligns with constructivist perspectives on language learning. According to Denzin and Lincoln (2018), it enables researchers to explore complex social phenomena by understanding participants subjective experiences and meanings. In addition to assessing observable facts, interpretive research methodology seeks to understand the relevance of social phenomena and human experiences by revealing their meanings (Wu & Chen, 2005). The focus on subjective meanings and social realities is fundamental to this method, in which researchers acquire, produce, and analyze data in ways that capture the subtleties and complexity of social situations and human behavior (Yanow & Schwartz-Shea, 2006). This approach is particularly suitable for examining technological interventions in language education, as it allows for nuanced exploration of learner perceptions and experiences. Applying interpretive research paradigm can provide deep insights into how learners perceive the use of AI-based apps to achieve spoken fluency. It goes beyond the scores, adds depth and nuances to findings through its focus on understanding participants subjective experiences.

1.2.Mixed method methodology

This dissertation employs a Mixed-Method methodology, an approach that combines quantitative and qualitative data to gain a comprehensive understanding of a phenomenon. It is particularly practical for exploring complex issues (Turner et al., 2024). It combines the

strengths of each method, offering insights into general patterns while capturing individual experiences, thus enriching social science research (Hasan Emon, 2024). It also strengthens validity and address ethical considerations in social justice research, and it is particularly effective for addressing wicked problems that require diverse perspectives and methodologies (Solem,2024). In other words, mixed-method research essentially combines quantitative and qualitative research methods to provide a thorough grasp of the topic under investigation. This is because quantitative data yields larger findings, while qualitative data offers in-depth and precise insights. Because mixed method research blends quantitative performance indicators with qualitative insights, it is adequate for examining how AI affects speaking fluency. This method considers both objective elements like motivation and confidence as well as quantifiable gains like speaking rates and accuracy. The study offers a comprehensive picture of how AI affects fluency development by first evaluating fluency scores and then investigating learners' viewpoints through surveys, Interviews, or questionnaires.

1.3.Case Study Research Design

The research employs a qualitative case study design with integrated mixed-methods approach. Yin (2017) argues that case studies are particularly effective for in-depth investigations of contemporary phenomena within their real-world context. By combining qualitative and quantitative methods, the research can capture both subjective experiences and measurable linguistic performance outcomes.

Case study is a robust and flexible methodology used to explore phenomena within their real-life contexts, provides a comprehensive and in-depth understanding of intricate and complex problems (The Role of Context in Qualitative Case Study Research: Understanding Service Innovation, 2022). It is especially helpful in domains where the context has a great impact and a significant role on the phenomenon under investigation such as business or education (Shiddike & Rahman, 2020).

This research design includes the selection of a specific and bounded case that offers distinctive insights which are analyzed and examined using a range of qualitative methods, including interviews and document analysis (Gustafsson, 2024). Overall, case study research provides a comprehensive framework for exploring and understanding multifaceted educational innovations and interventions in their authentic settings. In this research, case study is

implemented by selecting a specific class group from the department of English at Bouira university which is the second group of third-year license. Several AI based tools will be given to these students for training during a limited period of time. They will have a pretest before using these apps , and another post test to track their speaking fluency development. The results of this research design can offer transferable insights to similar contexts.

2. Participant Selection and Sampling Strategy

2.1. Purposive Sampling Rationale

This research was conducted at the University of Akli Mhand Oulhadj, Bouira, specifically at the Department of English during the academic year 2024/2025. Students' test, the distribution of the questionnaire and the teacher interview were conducted during the second semester of the academic year 2024/2025. To select a sample for this study, it is obligatory to identify the participants from whom the result will be generalized. This research focuses on the third-year license students (L3) at the department of English. Therefore, the first group is selected from the whole students' population of the department. The targeted sample size ranges between 30 and 40 students, selected through purposive sampling which is the most appropriate method for selecting participants in this study, it is a type of strategic and criterion-based selection that is especially well-suited for qualitative research. It is also a non-random sampling technique where researchers intentionally select participants based on the specific purpose of the study (Andrade, 2021). This technique aims to gather unique and valuable information from each participant, ensuring that individuals chosen, can provide rich insights relevant to the research (Suen et al., 2014).

Since this research investigates the role of AI-based applications for speaking fluency enhancements, this needs participants who have experience using AI tools for speaking practice. Purposive sampling ensures that only students who meet this criterion are selected, leading to more relevant and meaningful data. Purposive sampling increases the validity and reliability of the findings by ensuring that both quantitative (questionnaire replies) and qualitative (interview insights) data originate from knowledgeable participants. This method enables obtaining in-depth information from individuals who are directly involved, producing richer and more insightful findings.

The research established precise inclusion and exclusion criteria which are crucial to preserving the validity of the research. Therefore, students from Bouira University English Department those learners who have used AI-based speaking tools such as speech recognition app, AI chat bots, or pronunciation software are included as participants to ensure relevance to both, the research context and experience. Inclusive individuals are those who have never used AI for speaking practice as they do not provide relevant insights into AI impact. And since the study focuses on fluency enhancements rather than initial language acquisition, Beginners with no prior English-speaking skills are also excluded in addition to those Participants unwilling to engage in interviews or surveys. To ensure representativeness of the sample, it is essential to primary define the criteria of the entire population it aims to study, the population involves students in the department of English in University of Bouira, Learners from different levels of proficiency and AI usage experience engaged in speaking practice using AI-based tools for language learning. To make the sample more reflective of the university student body, it is significant to ensure participation of both male and female students from various linguistic and educational backgrounds. The study guarantees that the results are applicable to a larger population of university English learners by choosing participants who fit these criteria.

3. Data Collection Instruments

Two data collection instruments are used in this study to examine how Artificial Intelligence (AI) can improve students speaking fluency. Students will initially be given a questionnaire with a variety of questions to find out about their thoughts and experiences with AI tools. Additionally, participants will take pre- and post-oral tests.

3.1. The Questionnaire

The questionnaire is a primary research instrument for data collection, requiring participants to respond to predefined options or provide written answers (Yu, 2024). It can include multiple-choice, Likert scales, and open-ended questions, each serving different research needs (Davis et al., 2024). According to Mcleod(2023) questionnaires are a cheap, fast, and easy method to collect a lot of information from a large group of individuals. In a simpler way, a questionnaire is a research instrument that uses a series of questions to gather information from respondents. It is frequently used to collect data for surveys, experiments, and other types of research projects.

The structure of the questionnaire used in this study is designed to cover several key sections, including demographic data to contextualize participant backgrounds, patterns of AI language learning tools, applications, and usage, learners' self-assessment on their language proficiency and their attitudes regarding the integration of technology in language learning. This framework guarantees a holistic understanding of the learners' engagement and interaction with AI tools and their perceptions of its impact on language development.

This questionnaire used is a combination of 28 closed– ended and open-ended questions. The closed-ended questions provide participants limited options, while the open-ended questions allow respondents to freely express their thoughts. It is divided into four (4) sections. The first section gathers demographic information, including participants' age, gender and their level of speaking proficiency. The second section involves students' use of technology and AI in learning ; it consists of seven (7) questions, three closed-ended (Yes/No) question (Q3, Q4, Q5), and four (4) multiple choice questions (Q1, Q2, Q6, Q7). The third section focuses on students' perceptions towards AI in enhancing their speaking fluency, it contains fifteen (15) items, the first eight questions (Q1, Q2, Q3, Q4, Q5, Q6, Q7, Q8), are in a form of matrix questions, the other seven (7) are multiple choice questions. Finally, the fourth section deals with learners' challenges in utilizing AI tools and some suggestions for future use. It consists of one multiple choice question (Q1), one semi-structured question (Q2) where students say YES or NO, then explain the reason of their answer (WHY), and one open-ended question(Q3).

3.2 Pilot of the Questionnaire

Ensuring the reliability of a questionnaire is a multifaceted process that involves careful design, testing, and analysis. Reliability refers to the consistency of the questionnaire results over time and across different contexts. To achieve this, researchers must focus on several key aspects, including question clarity, pilot testing, and statistical validation. Crafting clear and unbiased questions is crucial. Questions should be straightforward and culturally sensitive to avoid misinterpretation by respondents(Bang, 2024). The structure and order of questions also play a significant role in maintaining consistency(Sarmah & Hazarika, 2012). In short, ensuring the reliability of a questionnaire means making sure it consistently measures what it is intended to measure. To ensure the reliability of this questionnaire, we kept the questions far from any sense of ambiguity, the questionnaire contains clear, simple and well-rounded items,

all questions are kept direct and specific. We also used a uniform response scale (Likert scale and matrix questions). We ensured that all respondents complete the questionnaire under similar conditions. In addition to designing several items measuring the same concept, we administer the same questionnaire twice to the same participants after some time.

3.3. Semi-Structured Interviews

Semi-structured interviews are a valuable research technique that focuses on specific themes in a conversational style, allowing for a deeper understanding of motivations, attitudes, and impacts on individuals' lives (Adams, 2015). They are a qualitative research method that combines structured and unstructured elements, allowing for a flexible yet focused exploration of specific themes. Its flexibility encourages participants to share themes important to them, which may not have been anticipated by the researcher (Barrick, 2019). This method is beneficial for exploring complex issues by using probes and spontaneous questions to deepen understanding. This can guarantee a balance between predefined questions and open-ended discussion (Wilson, 2014).

The Interview used in this research was designed to provide rich, contextual data on participants' experiences with AI language learning tools. Under the guidance of Kvale and Brinkmann principles (2009), the interview will involve a selection of a group of 8 students. This interview was conducted face-to-face, allowing for immediate answers and a more personal and responsive interaction. It focused on exploring students' perceptions, experiences, and the perceived impacts of using AI tools in their language learning journey. This qualitative approach aims to uncover in-depth insights that may not be captured through quantitative methods alone.

3.4 Speaking Performance Assessment

Speaking performance evaluation in this research will be conducted in accordance to a structured protocol designed to measure the influence and effectiveness of AI-assisted language learning. It started with a pre-intervention baseline evaluation to measure participants initial speaking proficiency. Later, students will interact and engage with AI language learning tools and applications, this leads to the final step which is a post intervention evaluation to identify any improvements in their speaking proficiency level, and whether their performance has

improved. The evaluation focuses on four main criteria which are pronunciation accuracy, fluency, vocabulary range and grammatical complexity. The selection of these dimensions helps provide a thorough and comprehensive assessment of learners' speaking skills, making it possible to compare the results of pre- and post-intervention outcomes.

4. Data Analysis Techniques

Following data collection, information is objectively analyzed and presented. Both qualitative and quantitative methodologies are used in the study's dual approach to data analysis. The type of data gathered determines the appropriate data analysis strategy. For the quantitative data, both descriptive and inferential statistics are used in addition to regression analysis. Whereas qualitative data is analyzed using both thematic and content analysis.

4.1. Quantitative Analysis Methods

Quantitative data analysis involves gathering, analyzing, and interpreting numerical data using statistical techniques (Sekar & Bhuvaneswari, 2024). It involves the application of statistical methods to summarize and interpret numerical data. This process includes both descriptive statistics, which summarize data characteristics, and inferential statistics, which allow researchers to generalize results over a population based on sample data. Mastery of these techniques enables researchers to draw meaningful insights and comparisons, ultimately enhancing the understanding of the investigated problem (Lemon et al., 2010). In this study both statistics are used.

4.1.1 Descriptive statistics

According to Vetter (2017), descriptive statistics are techniques for effectively calculating, characterizing, and summarizing research data. They are essential to the analysis and interpretation of questionnaire data in our study on the application of AI to improve speaking fluency at Bouira University. For example, we can efficiently summarize participant answers to questions like; How frequently should AI tools be utilized in oral expression classes by computing frequencies and percentages? Descriptive statistics are also useful for comparing fluency scores before and after the AI-based intervention, providing a clear picture of any changes that may have occurred. While a variety of graphical representations, including histograms, box plots, and bar charts, help to meaningfully illustrate and compare the outcomes

before and after the intervention, frequency distributions can be utilized to display changes in fluency levels.

4.1.2 Inferential statistics

A subfield of statistics known as inferential statistics allows researchers to draw conclusions about a population from data gathered from a sample (Plaue, 2023). It is essential for testing theories, calculating population parameters, and making inferences that go beyond the available data (Teja, 2018). Inferential statistics are crucial in studies that seek for generalization because they enable researchers to extrapolate their findings to broader groups, unlike descriptive statistics, which are restricted to describing observable data (Khakshooy & Chiappelli, 2018). Inferential statistics are essential in our study on the impact of AI on speaking fluency to determine whether our findings are statistically significant and can be generalized beyond the sample. These techniques enable us to evaluate how will AI-based tools improve students' oral fluency and estimate their potential impact across similar educational contexts. For example, an Independent Samples T-Test can be used to make comparison between the fluency scores of students in the experimental group (who used AI tools) with those in the control group (who did not), helping us determine whether AI significantly influenced speaking performance. Furthermore, the questionnaire includes Likert-scale items regarding AI use and perceived fluency improvement, inferential techniques like correlation analysis can be used to determine whether there is a relationship between variables, such as whether higher fluency scores are linked to more frequent AI use. The degree to which AI use impact fluency can also be predicted using regression analysis, which can reveal if students who use AI tools for more than five hours a week perform better than those who use them less frequently.

Additionally, ANOVA (Analysis of Variance) SPSS or R software, can be used to determine if AI-based interventions results in varying degrees of progress among students who are categorized by competence level (beginning, intermediate, and advanced). When combined, these inferential techniques offer solid proof to either confirm or deny our theories and bolster the overall reliability of our findings.

4.1.3 Comparative analysis

Comparative analysis is a multidisciplinary research method generally used in fields like education, linguistics and social science, it aims to evaluate and contrast different units of the study (Abdullah, 2022). This research method allows researchers to detect patterns, draw significant insights and improve comprehension through examining and analyzing both similarities and differences in various contexts or periods of time (Azarian, 2014; Rogers, 2014).

4.2 Qualitative Analysis Methods

Qualitative data analysis refers to the systematic process of interpreting examining, analyzing and making sense of non-numerical data, such as words, images, or observations, to comprehend ideas, concepts, opinions, or experiences. According to Creswell (2014) It entails "organizing data, coding it into categories or themes, and interpreting the larger meaning of the information." Similarly, Patton (2002) defines it as the process of transforming data into findings by interpreting participants experiences and perspectives. Qualitative data analysis is used in this study to better understand the attitudes, experiences, and observable actions of students as it explores the function of AI in improving speaking fluency. In particular, interview transcripts are analyzed using thematic analysis, which enables the researcher to pinpoint important themes that surface from participants spoken comments. In order to classify and measure recurrent behaviors and classroom interactions pertaining to the usage of AI tools, content analysis is simultaneously applied to observation notes. This dual approach enhances data interpretation and guarantees a thorough comprehension of how AI supports the growth of speaking fluency in the classroom.

This study uses a mixed-methods approach, combining quantitative and qualitative findings to guarantee a thorough knowledge of the effect of AI on learners speaking fluency. In order to provide a comprehensive picture, information from the interview are contrasted and integrated during the interpretation and discussion phase. The questionnaire quantitative data will offer quantifiable opinions and broad trends about the application of AI in speaking exercises. These trends will then be cross-checked against qualitative data, such as categories derived from observation notes and themes found in interview transcripts. For instance, participants thorough explanations in interviews will either confirm or refute the assertion that

student engagement has risen, as indicated by the questionnaire results. This convergent study ensures more dependability and broader understanding into how AI tools influence speaking fluency by providing both breadth (from data) and depth (from narratives and observations), in addition to validating the results across approaches.

5. Ethical Considerations

Adhering to the ethical guidelines proposed by the British Educational Research Association (BERA, 2018), the research will ensure strict ethical rules to protect each participant rights, safety, and dignity. All research participants will provide their informed consent before participation. Participants will receive a clear explanation of the study's objectives, procedures, and their rights, including the right to withdraw at any stage without any consequences. Several safeguards will be put in place to preserve participant identity and data privacy, which is crucial considering the usage of audio recordings. At no point during the study will the personal information of the participants be shared or released. Pseudonyms or special identifying codes will be used to anonymize any information gathered, including speech recordings. Only the lead researcher will have access to these recordings, which will be safely kept in encrypted files. To maintain confidentiality, all identifying information will be meticulously eliminated during transcribing and analysis. In order to ensure that participant information is handled legally and ethically, data processing and storage procedures will also adhere to international data protection laws, such as the General Data Protection Regulation (GDPR).The potential risks to participants are minimal. Nevertheless, some individuals may feel discomfort or anxiety due to the speech recording process. To solve this problem, participants will be fully informed about the procedures beforehand and will be free to pause or withdraw at any moment without facing any repercussions. On the other hand, using AI-driven learning resources could help participants become more fluent speakers and contribute to worthwhile studies that try to improve language instruction. Before data is collected, the academic supervisor will examine and approve the research design and methods. All procedures will conform to the ethical standards established by Bouira University and the broader research community.

Conclusion

This comprehensive methodology provides a structured approach to investigating AI role in language skill development, offering both theoretical insights and practical implications for educational technology integration. It started by defending the use of a mixed-method approach, which combines qualitative and quantitative data to provide a thorough comprehension of the research subject. The chapter also covered the methods for data collection and analysis, participant selection, and the research tools—the questionnaire and the interview—that were employed. To guarantee the validity and integrity of the investigation, ethical factors were considered. This methodology attempts to represent the complex nature of speaking fluency and the possible contribution of AI to its growth by utilizing both objective and subjective measurements. The results of this method will be presented and discussed in the upcoming chapters, providing information on the potential benefits and drawbacks of incorporating AI into language learning procedures.

Chapter three :

Presentation and discussion of the findings

Introduction

The goal of this chapter entitled ‘presentation and analysis of the findings,’ is to provide a clear and concise explanation of our research results .Through analyzing patterns, trends and participants views and perspectives, this chapter seeks to highlight the effectiveness of AI integration in improving speaking fluency. In addition to critically evaluating and interpreting the findings and provide comprehensive account to draw meaningful conclusions. The goal is to show whether the results confirm, support or refute the presented hypothesis of our investigation. This chapter is organized into three sections. The first one aims to present and analyze the results obtained from the questionnaire purposively distributed to the second group students of third-year license in the department of English. The goal of the second section is to showcase and examine the results gathered from the focus group interview that involved 8 randomly chosen students from the same group. The last section deals with the analysis of the teachers’ observation regarding the difference in speaking fluency levels of students before and after the use of AI tools.

1. Presentation of the Results of the Questionnaire

The questionnaire purposively distributed to the second group students of the third year license, is divided into 4 clear sections, each one aims to address a specific focus to support and ensure data alignment with our study objectives. The first section is deduced to collect basic demographic and background information of students. The second section delt with their learning habits and familiarity with technology and AI applications. After that learners’ attitudes regarding the effectiveness of AI in enhancing speaking skill are explored in the third section. The fourth and last section aims to gather qualitative data from students about their faced challenges while using AI in addition to their personal suggestions and recommendations on both AI integration and improvement in speaking fluency development.

Section One: General Information

1.1. Participants’ Background Information

This section aims to gather information about the participants’ age, gender and self-assessment of their level.

Question 01: Age

Age	19 years old	20 years old	21 years old	22 years old	23 years old	24 years old	27 years old
percentage	4.2%	33.3%	41.7%	8.3%	4.2%	4.2%	4.2%

Table 01 : learners' Age.

The table shows that learners included in this research have different ages starting from 19 to 27 years old, the majority of participants (8 respondents) are 21-year-old making it the dominant age with 33%. This reflects a diversity of life experiences and cognitive developments of individuals which are helpful in making data more generalizable.

Question 02: Gender

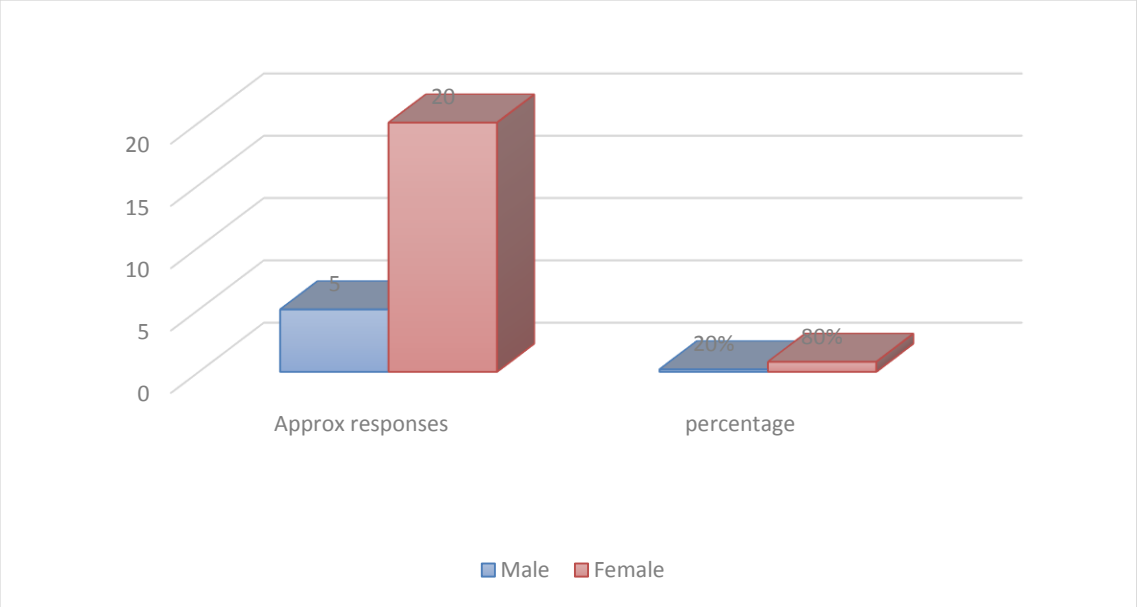

Figure 01 : Learners' Gender.

The diagram presents how participants are distributed based on their gender. It shows that female dominate the sample with 80% (20 respondents), while males only represent 20% (5 respondents) from the whole population. This may be linked to the gender imbalance in the class group.

Question 03: How would you describe your current level of speaking fluency in English?

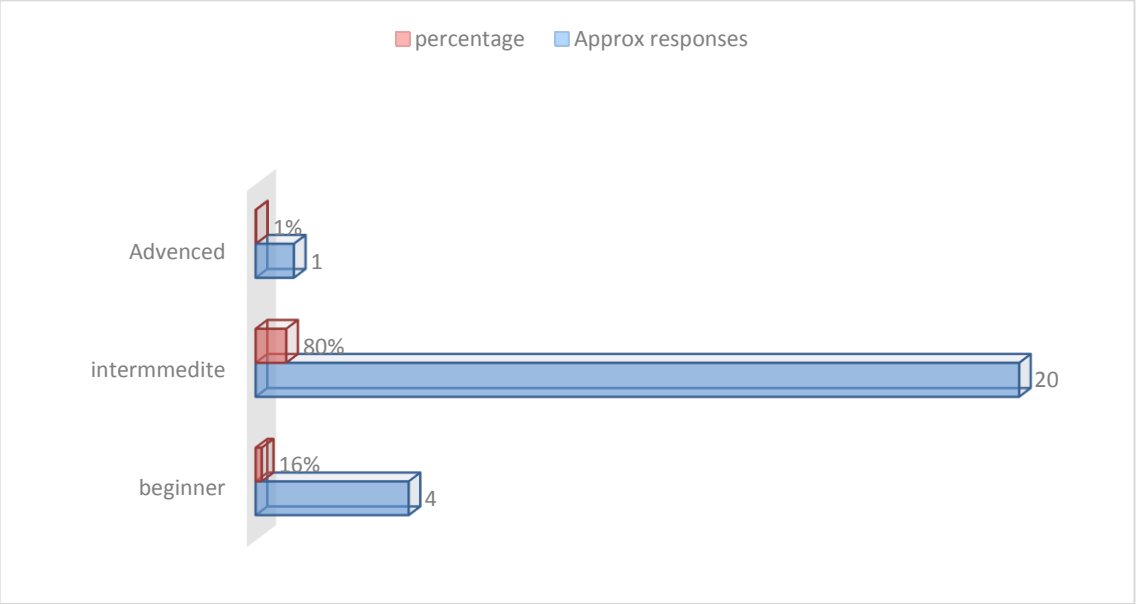

Figure 02 : learners' level.

The table demonstrates that the majority of participants (60%) evaluate their speaking fluency level as intermediate, 4 students (16%) replied that they are still beginners. However only 1 participant (4%) rates his/her level as advanced one.

Section Two: Use of Technology and AI in Learning

This section specifically deals with participants' learning habits and their use of AI tools.

Question 01: How much time do you dedicate to speaking English during each practice session?

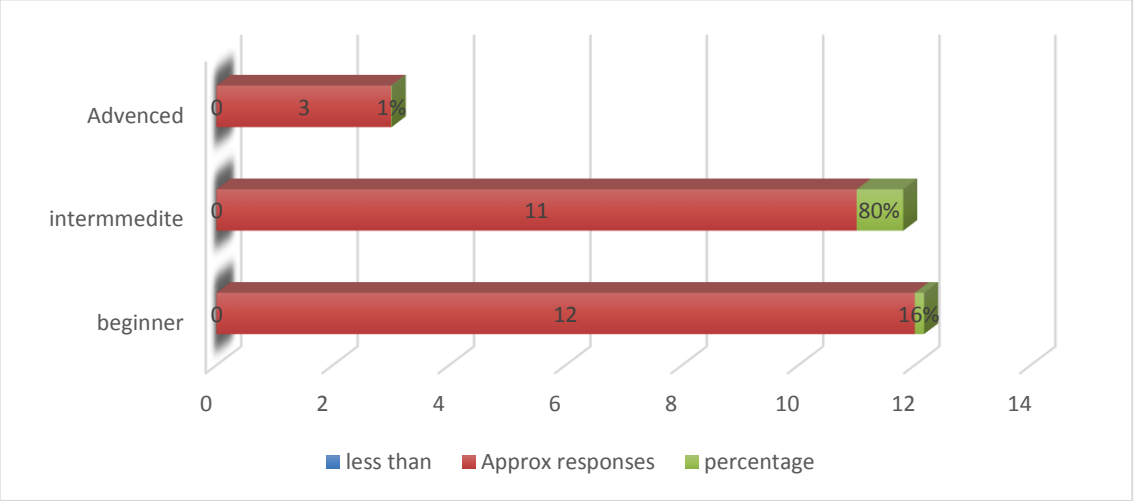

Figure 03 : learners' time allocation of speaking session practice.

According to the chart that represents learners' duration of speaking practice per session, the majority of them (48%) spend less than 15mn, another group of 11 individuals (44%) spend between 15 and 30mn. The less majority (12%) practice from 30 to 60mn. However no one spends more than one hour in speaking training. Most learners keep this session short may be due to their constraints, as they often juggle different responsibilities in their daily life, this will limit the time deduced to practice. Another reason is linked to psychological issues like anxiety, learners feel nervous when speaking, thus short sessions reduce their stress and help them manage their practice. Otherwise, very few students engage in longer and intense training sessions.

Question 02: Have you ever practiced speaking English using digital tools or technology?

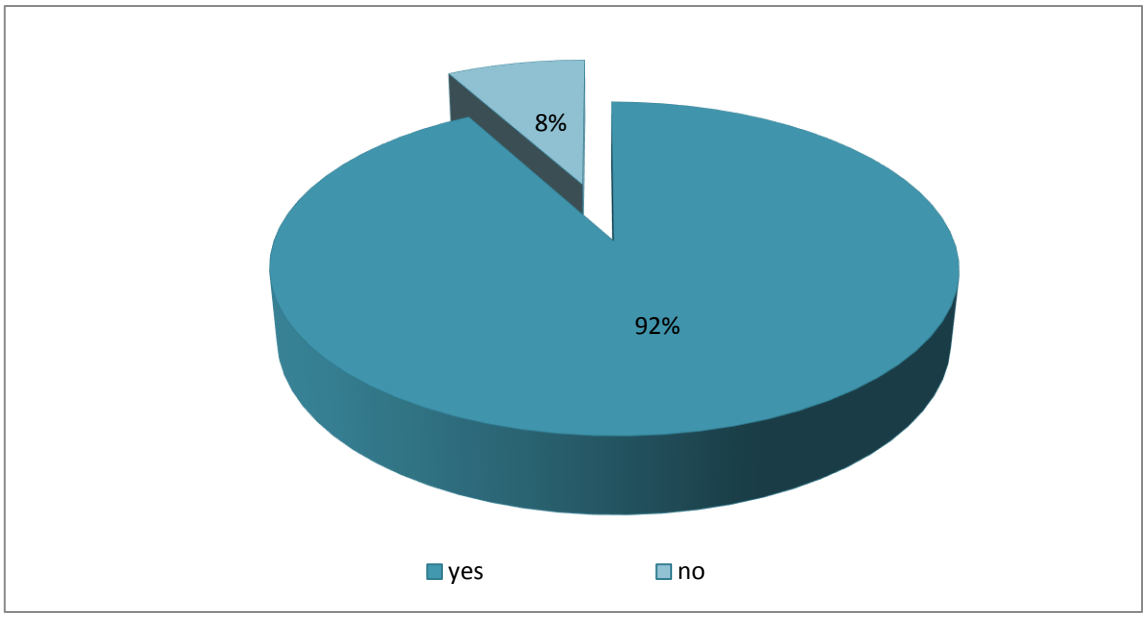

Figure 04 : learners' use of digital tools for speaking practice.

The chart illustrates whether learners have already used digital tools to practice speaking. The results show that 92% replied by YES, these persons integrate technology and AI in their language learning habits, they benefit and get the aid from intelligent solutions. In contrast, only 8% admit that they never utilized technology practicing their language. These may have a lack of digital literacy, or no reliable access to internet, also the fact that some students prefer and trust traditional methods or face-to-face interactions more than relying on technology-based applications.

Question 03: Are you familiar with Artificial Intelligence (AI) tools (e.g., voice assistants, chat bots, language learning apps like ELSA Speak, SpeakPal, ChatGPT, etc.)?

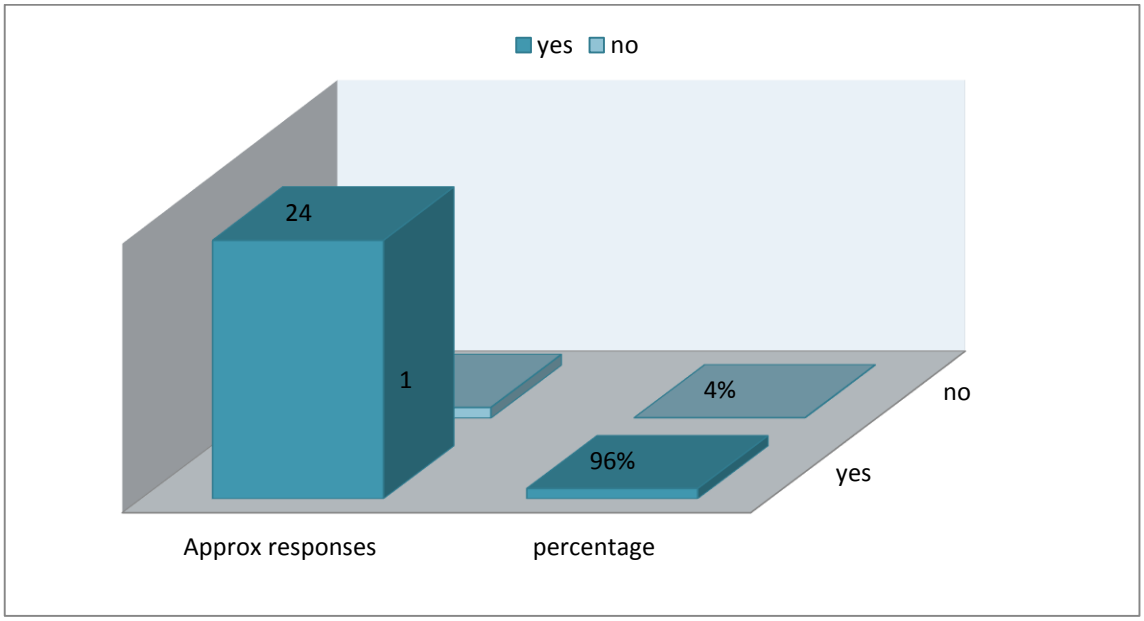

Figure 05 : learners' familiarity with AI tools.

The graph shows students' familiarity with AI tools for language learning. As it shows that the overwhelming majority (96%)are familiar with intelligent applications including voice assistants, chat bots, language learning apps (ELSA Speak, SpeakPal, ChatGPT ELSA speak, dualingo) this indicates that they are digitally literate, they show a given level of comfort and willingness while using technology. They prefer integrate new methods into their learning process, they are modern learners who do not only rely on traditional class activities, but they know about current tools and trends to customize their learning and get their needs, personalized practice and immediate feedback. In contrast, only one person replied by NO (4%), she/ he had no interaction with AI before, may be due to a lack of experience in navigating new technologies or she/ he prefers relying only on traditional methods rather than modern ones that can simply be unware of their existence and benefits in language development.

Question 04: If yes, which AI tools have you used? (You may select more than one)

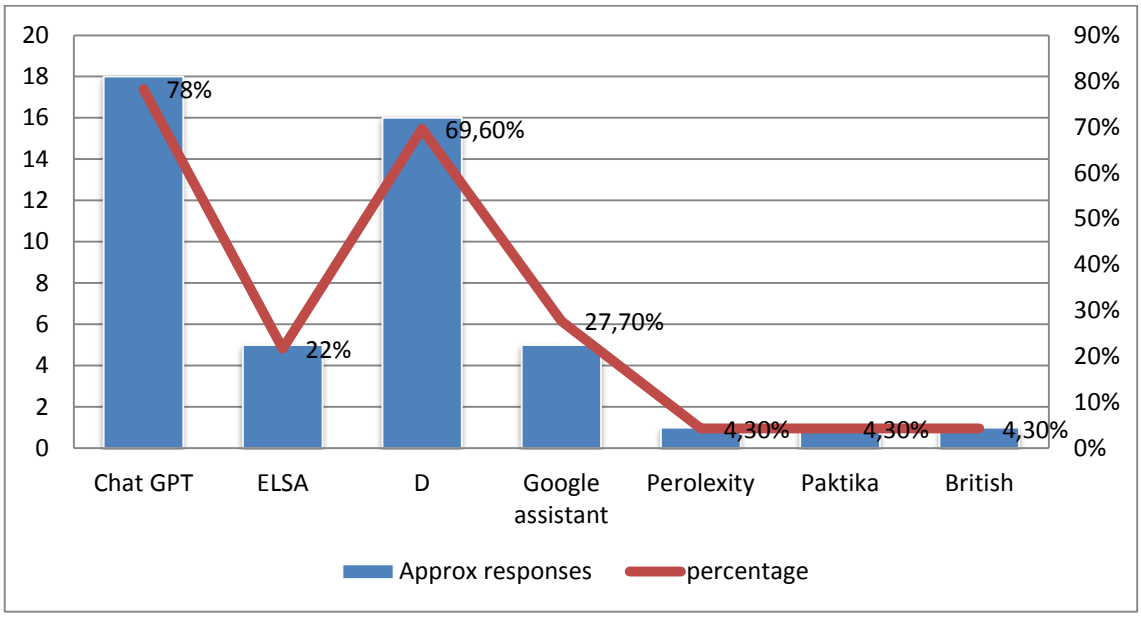

Figure 06 : learners' AI-powered tools used for the English-speaking train.

The findings show that both chatgpt and dualingo. A hight proportion of respondents (78.3%) use chatgpt as a tool to train their English-speaking skill, this indicates that it is the most popular and useful for discussions and train. Dualingo as well ranks high (69.8%), due to its availability, clear usage, diversity of activities, gamified and structured practice in addition to the immediate feedback. A smaller but notable number of learners about one fifth of respondents use both Elsa and voice assistants (21.7%). These applications are specifically designed for fluency and pronunciation. Meanwhile, a smaler number (4.3%) used tools like perplexity, Practica and British councils making them the less common applications. This may be linked to their lower visibility, especially that perplexity is first known as an AI for research rather than language learning.

Question 05: How often do you practice speaking using these tools?

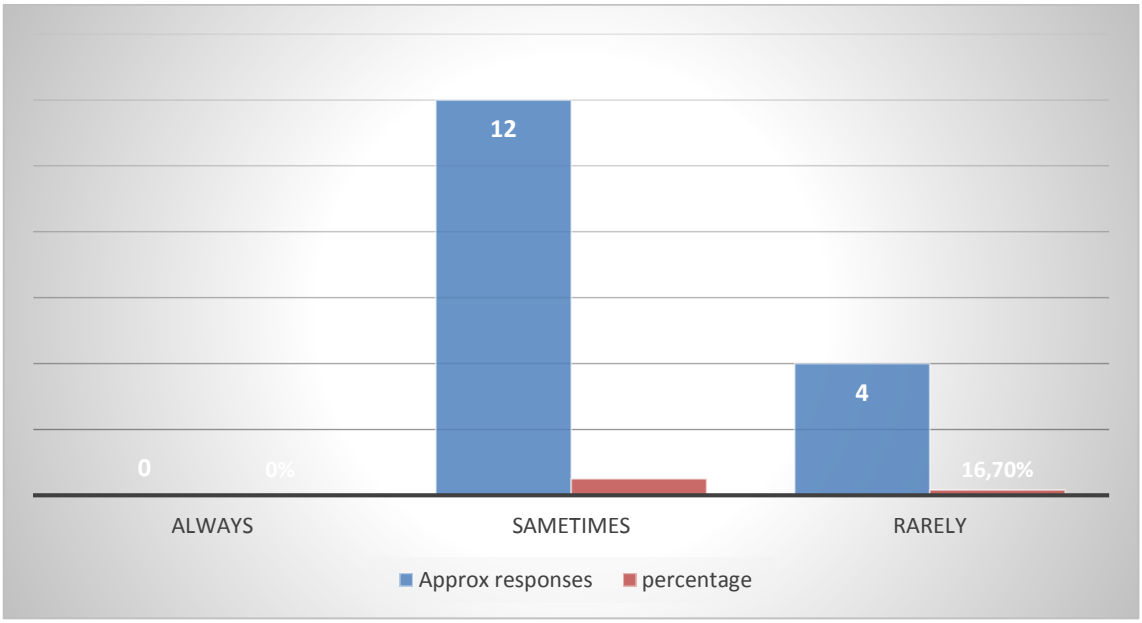

Figure 07 : learners frequency of practicing English speaking using AI tools.

The chart illustrates how often people use AI tools to practice their spoken English. The options are " always, often, sometimes and rarely." The results reveal that none of the participants always use technology in speaking skill enhancement. In contrast, 50% of the population state that they sometimes use these AI tools , while 33.3% admit often using them. Additionally, only 16.7% rarely practice their English. The results' reason may be linked to students' engagement and motivation towards technology as high frequency use correlates with strong motivation and clear learning objectives. Also, their perceived usefulness and experience, those who believe that AI tools are effective or they experienced impros in their fluency, will use them more frequently.

Section Three: Perceptions towards AI for speaking fluency.

This section investigates students' perspectives of AI's impact on enhancing English-speaking fluency, emphasizing their views on its efficacy and limitations.

	Agree	Neutral	Disagree
1. Artificial intelligence (AI) techniques can enhance English-speaking fluency.	**84%**	**12%**	**04%**
2.Artificial intelligence systems offer real-time feedback on fluency and pronunciation.	**84%**	**12%**	**04%**
3. AI tools make speaking practice more interactive, motivating and engaging.	**68%**	**20%**	**12%**
4.Using AI tools gives me more confidence to speak in English.	**84%**	**16%**	**00%**
5.AI tools improve my pronunciation and intonation.	**84%**	**16%**	**00%**
6.AI tools can be effective in improving learners' speaking fluency.	**92%**	**08%**	**00%**
7. " using AI tools and apps has improved my speaking fluency"	**92%**	**08%**	**00%**

Table 02 : learners' agreements on the statements.

The strong agreement among the majority of third-year students demonstrate a high degree of confidence in AI's capacity to develop speaking abilities. 84% of the participants believe that AI methods can improve the speaking skill and provide immediate feedback on pronunciation. Underscoring AI's ability to detect and rectify mistakes quickly which is an important factor in advancing conversational skills .In addition , 68% of the respondents think that AI enhances the interactivity, motivation, and engagement of speaking practice, implying that learners benefit from the active and interactive characteristics of AI-powered platforms. These findings suggest that tools such as speech recognition apps, pronunciation assessors, and AI-driven chat bots are effective in assisting learners through engaging, self directed and feedback-filled experiences. The data showed that 80% of students agree that AI tools have a

great impact on building speaking confidence, refining pronunciation and aiding fluency, which indicates that AI plays a crucial role not only in language growth, but also in the psychological side such as motivation and reducing speaking anxiety. Simultaneously, the minor percentage of neutral or disagreeing responses (08%-16%) might be due to personal variation in learning styles or prior exposure to AI, rather than fundamental issues with the technology itself.

Question 08: In your opinion, how should frequently AI tools be utilized in oral expression classes?

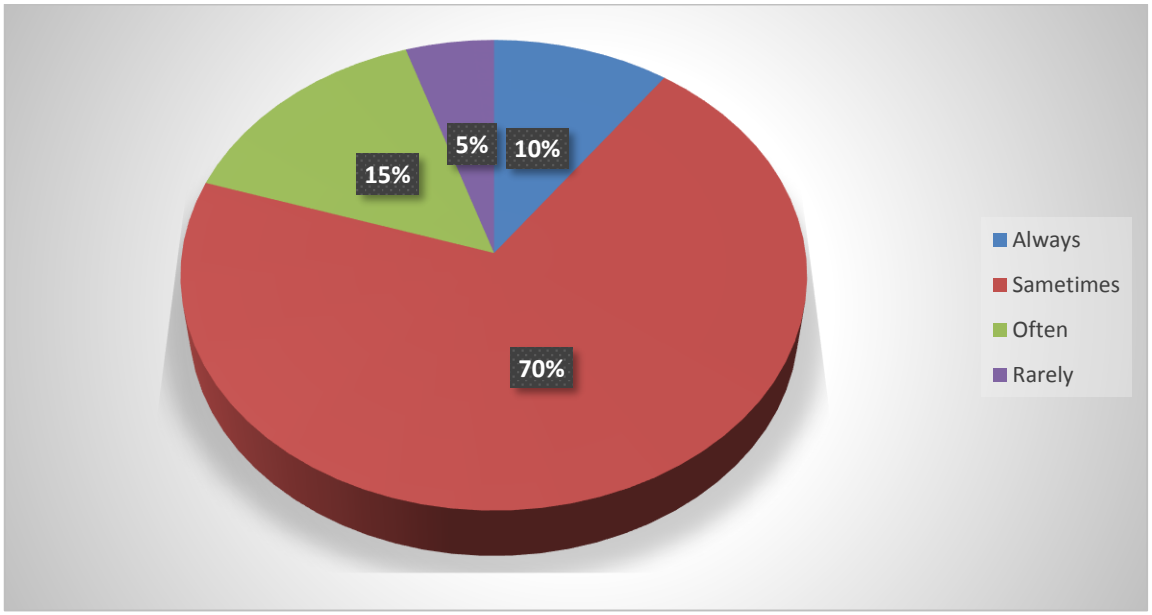

Figure 08 : learners' opinion regarding the suitable time deduced for AI tools use in the classroom.

The results of this diagram affirm that a balanced use of AI applications in oral expression classes is strongly supported by the learners, as 58,3% of participants selected "sometimes," 25% chose "often," and 12,5% picked "rarely." The responses of the learners highlight a considerable interest in employing AI as an enhancement to students' English-speaking fluency. The "sometimes" option points that the respondents recognize the benefits of artificial intelligence in improving speaking skill. For insurance, providing real-time correction or pronunciation practice. The 25% who support the frequent usage of AI might appreciate its availability, reliability and absence of judgment which can create a secure and comfortable environment for practicing conversations. While, the lowest percentage that prefers infrequent

use probably recognizes the irreplaceable role of human teachers in fostering oral communication.

Question 09: **which areas of speaking fluency do you believe AI tools can most effectively assist with?**

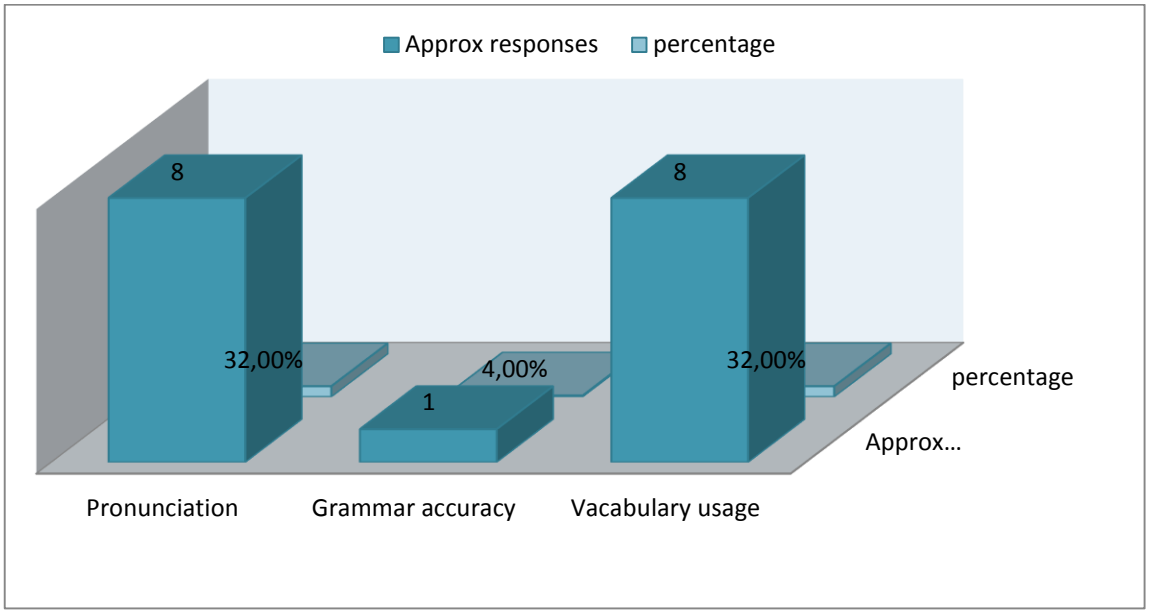

Figure 09 : Learners' opinion about areas of speaking fluency, AI tools can improve.

Based on the results showed in the graph, the pronunciation is the most frequently supported skill by AI technologies, chosen by 32% of the participants. Grammar comes in second at 20%, and vocabulary comprises 12%. Fluency/ coherence and confidence; two essential elements of spoken communication, had significantly fewer selections.

The high percentage for pronunciation shows that learners value AI's ability in this area. Numerous AI-powered programs offer accurate, immediate feedback on articulation, stress and intonation enabling learners to improve their pronunciation via repeated, self-guided practice. Similarly, the 20% who selected grammar reflects AI capabilities to support grammatical precision by detecting errors instantly and providing corrections. While fluency earned fewer selections. This likely because of the more complicated and interactive character of fluency as a skill rather than a lack of AI usefulness. Fluency indirectly gains from the automation and accuracy that AI encourages in grammar and pronunciation. As learners build confidence in these areas. They acquire the ability to speak more smoothly and cohesively.

Question 10: which method has improved your speaking fluency more?

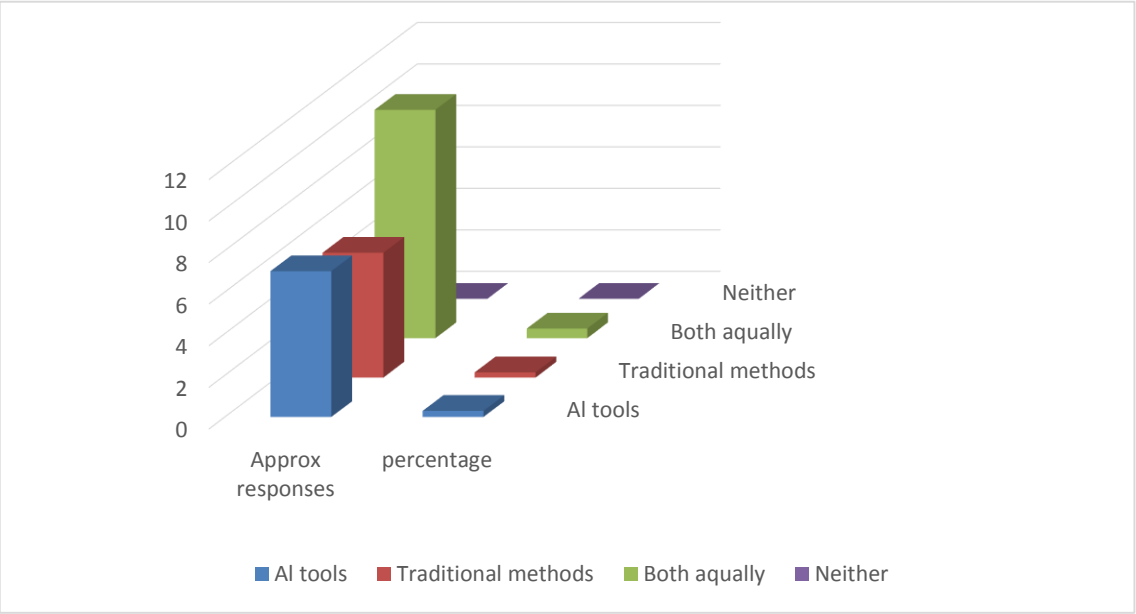

Figure 10 : Learners' helpful method for speaking improvement.

The results of this diagram reveal that 29% respondents believed that AI technologies enhanced their speaking fluency, while 25% preferred traditional methods. The largest group 45,8% stated that both approaches were equally useful. And none selected "neither". This implies that all students saw a degree of enhancement in their fluency, with AI playing a crucial role either independently or in combination with traditional Technics.

Question 11: Are you open to using AI tools more frequently for speaking practice?

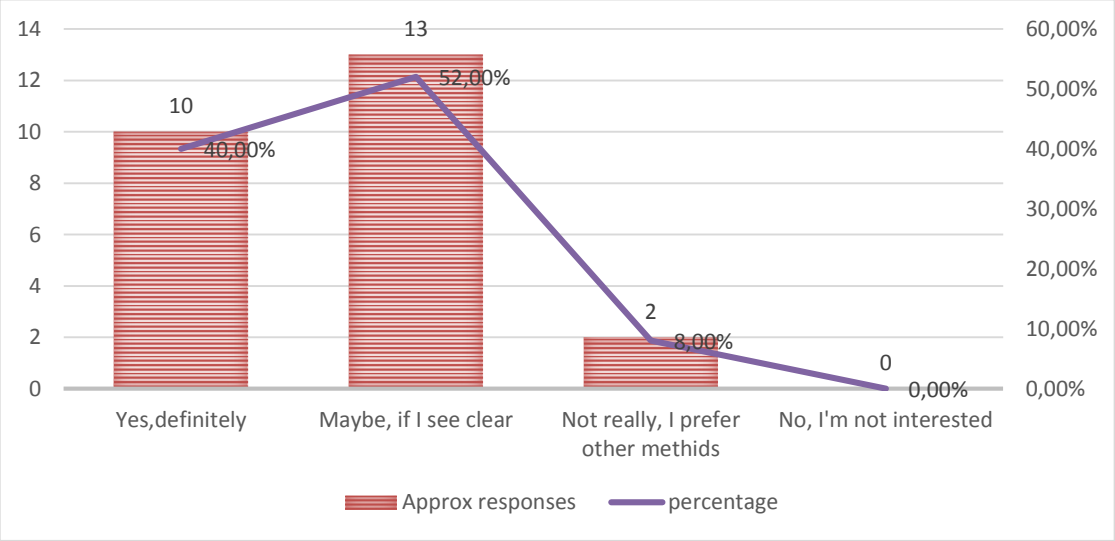

Figure 11 : Learners' willingness to increase their use of AI for speaking practice.

According to the findings, 40% respondents are definitely open to use AI tools more frequently for speaking practice, whereas the majority 52% show conditional openness, meaning they would use AI if clear benefits are demonstrated. Only 8% expressed that they prefer other methods and 0% were not interested at all . This indicates that the learners have a generally positive view regarding AI in language learning, especially in speaking fluency, as 90% of them being interested in utilizing AI apps. The significant rate of conditional responses showed that the learners are not completely confident in the effectiveness of AI in improving their speaking fluency and this may be due to the limited experience with AI tools or a belief that traditional methods are more reliable for language learning. The low resistance (8%) and total lack of disinterest highlights the high level of receptivity to AI-powered speaking practice.

Question 12: How likely are you to replace some of your traditional speaking practice with AI-powered speaking exercises?

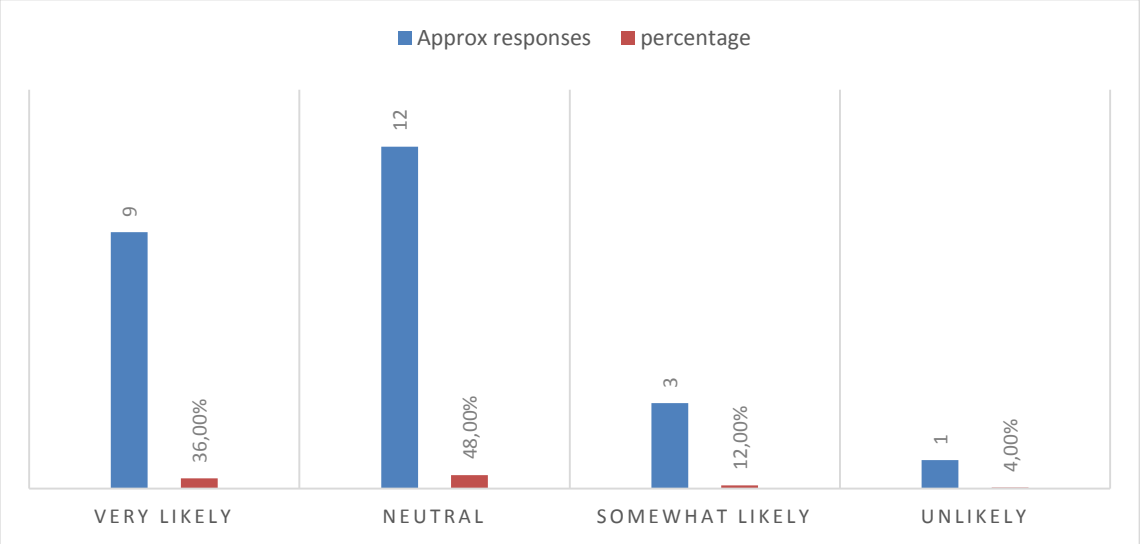

Figure 12 : Learners' intention to replace traditional methods with AI-powered speaking exercises.

The diagram indicates learners' chance of substituting traditional speaking practice with based tasks. 36% of students affirmed that they are very likely to make the change. While 12% is somewhat likely and 48% remained neutral. With only 4% saying they are unlikely to do so. These results illustrate an increasing interest in using AI tools to improve speaking fluency as the majority of the participants accepted the idea of replacing some of their traditional speaking practices with AI-powered speaking exercises. The 36% who are very likely to adopt AI

emphasizes its expected ability to enhance fluency through interactive learning. The 48% who selected neutral indicates that although students are interested, many still require more exposure to or assurance in AI tools before completely adopt embracing them.

Question 13: How has your overall speaking fluency changed due to the use of AI tools and apps?

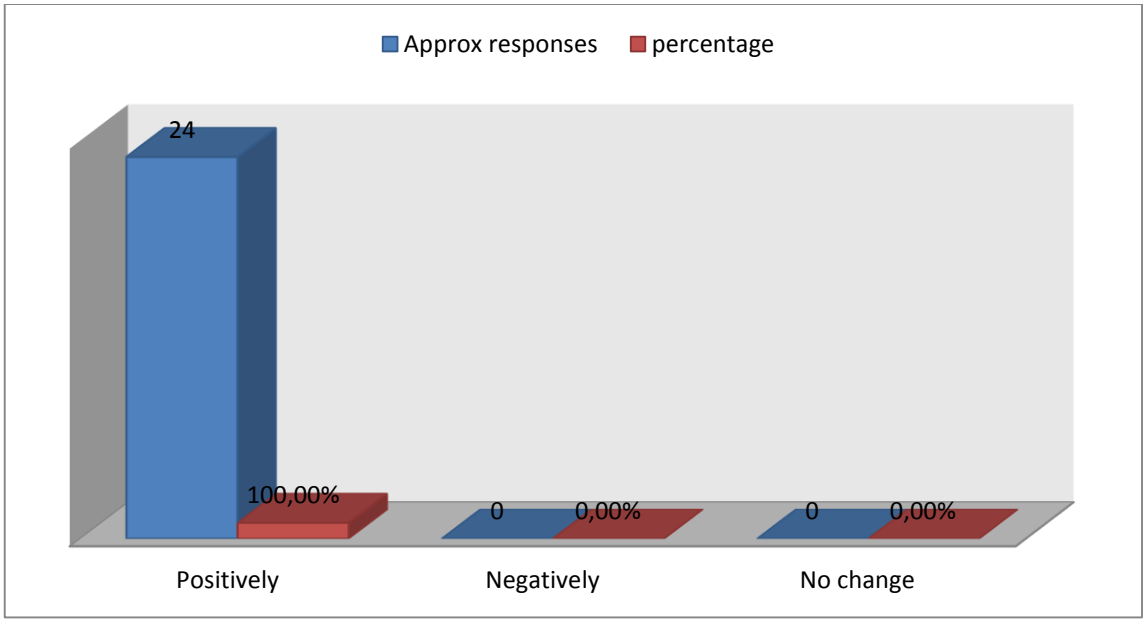

Figure 13 : Learners' overal speaking fluency change due to AI tools.

The diagram highlights a complete agreement among the learners, as the respondents affirmed that AI applications positively impacted their English-speaking fluency. This high agreement underlines AI's efficacy in enhancing fluency growth through immediate correction feedback, engaging speaking exercises, and adaptable practices. These features would improve students' confidence, pronunciation and speaking rhythm, leading to more engaging practice.

Section four : challenges and suggestions.

The section is designed to gather data related to learners' challenges and recommendations about enhancing speaking fluency using AI. It consists of one multiple response question and two open questions.

Question 01: What challenges have you encountered (or do you anticipate) when using AI tools for speaking practice?

Challenges	Frequency
Inaccurate feedback from AI	36%
Preference of human interaction	20%
Low digital literacy	20%
Lack of access to technology	16 %
Others (unspecified)	8%

Table 03 : learners' challenges when using AI tools for speaking practice.

Inaccurate AI feedback is the most commonly stated challenge, with 36% of the students replies. This indicates a notable worry among learners about the validity of AI-generated speech assessment, which can have a direct effect on the quality of fluency improvement. If the feedback is perceived as incorrect or overly restrictive, students might find it hard to improve their skills or lose their trust in the tool. Equally the low digital literacy and the preference of human interaction (noted by 20% of the participants) demonstrate that although AI has a potential, not all learners are adequately prepared or at ease to use it independently. Some individuals might not possess the technical skills needed to use AI effectively, while others value the adaptable assistance that teachers offer particularly for fluency related elements like tone, emotion, and contextual meanings. The lack of access to technology highlighted by 16 % respondents, continues to be a tangible obstacle that may limit the chance of utilizing AI for speaking practice. According to the results showed in the table , despite the opportunities provided by AI tools to enhance speaking skill, their effectiveness depends on users' exposure, proficiency and confidence in the technology.

Question 02 : Would you recommend the integration of AI tools into English-speaking classes at the university? Why or why not?

Only 15 students answered this question, their answers reveal a range of perspectives, the majority expressed their support, meanwhile a few show reservations and worries. The answers vary from

positive, negative and neutral. The majority recommend integrating AI, they admit that it has a powerful influence on learners' speaking fluency and vocabulary knowledge. In addition to the fact that it provides extra speaking time, comfort ans low stress specially for shy students who struggle with producing their spoken output, this boosts their confidence and autonomy. These respondents agree that involving technology and AI in speaking sessions is very motivating and breaks classroom routine. Furthermore, they claim that AI tools have a great capacity for analytic and immediate feedback, it corrects pronunciation, and create a real-time discussion which makes students engage more in such activities. One neutral answer does not deny the usefulness of AI. However, it prioritizes human interaction as a better way to rich a conversation. Meanwhile, there are only 3 persons out of 15, who expressed their skepticism, claiming that they prefer peer interaction and face-to-face discussions over technology. They also argue that AI tools works better for individual use and not for collaborative learning and group interaction. Another person simply rejected saying NO, without explanation, possibly due to a lack of awareness, resistance to change or disinterest. These insights suggest that AI is generally welcomed, it needs to be implemented in a balanced manner, to complete and do not replace human interaction.

Question 03 : Do you have any suggestions for improving the use of AI in enhancing speaking fluency?

The question is about learners' suggestions for improving AI use in enhancing speaking fluency. Some students offer a concrete suggestion, when others provide no input, either due to a lack of ideas or interest.

Based on the survey conducted, the majority suggested implementing AI in various ways. Responses included using storytelling and gamification strategies in AI language apps for a better motivation and engagement, they highlight the role of interactive conversations in term that AI keeps asking follow up questions to promote continuous speaking. Other suggestions involved creating specific AI tools designed only for oral expression that allows users to track progress independently and incorporating these tools like dualingo and Elsa into lessons for more structured teaching . Others focused on combining catboats and pronunciation checkers for spoken interaction and articulation support. For the neutral responses including no, I have no idea and it is already improved, indicates a possible limitations in AI tools familiarity or a lack of confidence or even participants burnout.

The study findings suggest that learners engagement is higher when they have personal experience with AI resource device knowledge, they show more creativity, positive attitudes and suitable suggestions. Therefore, educators should increase learners' exposure to different AI based apps and incorporate them into classroom activities to keep students more engaged.

2. Presentation and discussion of the findings of pre and post tests.

	PRETEST	POSTTEST
1	17	17.
2	13	16.
3	16.5	17.
4	16.5	18.
5	16	17.
6	14	17.
7	13	15.
8	13.5	14.
9	17.5	18.
10	15	14.
11	14.5	15.
12	12.5	15.
13	14	13.
14	16.5	17.
15	12.5	14.
16	15	17.
17	14.5	16.
18	13	14.
19	17	18.
20	16	18.
21	10.5	11.
22	15	16.
23	14	13.
24	14.5	15.
25	14.5	15.
26	16	16.
27	14	15.
28	14.5	15.
29	13.5	15.
30	16.5	18.
31	15	15.
32	16	16.
33	14.5	14.
34	14.5	15.
35	14	14.
36	14.5	15.
37	12.5	14.
38	13.5	14.

Table 04: learners' marks of pre and post tests.

Level of improvement after the use of AI	**Number of students**	**Percentage**
Improvement with three more than three points	5	13.16 %
Improvement with less than three points	26	68.42 %
The same level	3	7.90 %
Slight regression	4	10.52 %

Table 05: learners' level of improvement after the use of AI.

According to the table which represents the rates of the impact of AI Tools in enhancing speaking fluency among 38 students in pre and post-tests, the majority showed a modest level of improvement (81.58%).Meanwhile, a significant progress was marked among a small cohort along with a minor percentage of regression among others. Through these results, AI tools proved to be a potential supplementary educational assistant in speaking classes, demonstrating varied effectiveness across students' cohorts. The varied results can be attributed to the frequency of using the AI tools and the choice of the suitable apps that resonates best with the students' abilities and learning styles.

3. Presentation and discussion of the results of the semi-structured interview (focus group)

This section analyzes student perspectives from a focus group interview, examining three critical dimensions: self-assessed English proficiency, perceptions of AI-based learning tools, and recommendations for classroom integration. The findings reveal both the potential and limitations of AI in addressing the complex challenges of language acquisition.

3.1. Self-Assessed English Proficiency

Students demonstrated remarkable self-awareness in evaluating their English competencies, with proficiency levels spanning from beginner to advanced. A recurring theme emerged regarding the psychological dimensions of language learning, particularly how confidence levels directly influence perceived ability.

3.2. Key Challenges Identified:

- **Pronunciation Difficulties:** Many learners, including those at advanced levels, reported persistent struggles with accurate pronunciation, especially with unfamiliar vocabulary.
- **Vocabulary Limitations:** Participants across proficiency levels cited insufficient lexical knowledge as a barrier to fluent expression.
- **Conversational Anxiety:** Intermediate learners particularly noted a stark contrast between their fluency in private practice versus group settings, where anxiety often led to "mental blocks," forgotten vocabulary, and grammatical errors.

- **Skill Discrepancies:** Several students reported significant gaps between their receptive skills (listening/reading) and productive skills (speaking/writing), suggesting the need for more balanced pedagogical approaches.

Accordingly, these findings underscore that language proficiency cannot be measured solely by grammatical accuracy, but must account for psychological and situational factors that impact performance.

3.3. AI as a Language Learning Tool

Student responses revealed nuanced perspectives on AI's role in language acquisition, recognizing both its transformative potential and inherent limitations.

3.3.1. Advantages of AI Integration:

- **Personalized Learning:** AI tools provide immediate, individualized feedback, allowing learners to identify and address specific weaknesses at their own pace.
- **Vocabulary Enhancement:** Many participants praised AI applications for effectively expanding their lexical knowledge through contextual learning.
- **Accessibility:** The 24/7 availability of AI platforms enables consistent practice outside classroom hours.
- **Confidence Building:** Several students noted that AI creates a low-pressure environment for experimentation without fear of judgment.

3.3.2. Recognized Limitations:

Grammatical Complexity: Participants reported that AI tools often fail to provide the depth of explanation required for mastering advanced grammar concepts.

Lack of Human Nuance: The absence of genuine interpersonal interaction limits opportunities for developing pragmatic communication skills.

Quality Variability: Students emphasized that AI tool effectiveness varies significantly across platforms, requiring careful selection.

4. Recommendations for Classroom Integration

Focus group participants proposed balanced approaches for incorporating AI into formal education settings:

4.1. Strategic Implementation:

- **Supplemental Role:** AI should augment, not replace, human instruction—particularly for complex grammatical concepts and conversational practice.
- **Diagnostic Functions:** Educators could use AI analytics to identify class-wide and individual learning gaps.
- **Blended Learning Models:** Combining AI exercises with teacher-guided sessions could optimize skill development.

4.2. Psychological Considerations:

- **Anxiety Reduction:** Create low-stakes speaking opportunities using AI simulations before live practice.
- **Confidence Building:** Use AI's non-judgmental feedback to encourage risk-taking in language production.
- **Personalized Pathways:** Leverage AI's adaptive learning capabilities to address individual student needs.

These focus group findings demonstrates contemporary language learning dynamics. While AI tools offer unprecedented opportunities for personalized, accessible English practice, their effectiveness depends on thoughtful integration within a pedagogically sound framework. The most promising path forward appears to be a hybrid model that combines AI's technological strengths with the irreplaceable human elements of motivation, cultural context, and nuanced feedback. For educators, this means viewing AI not as a replacement, but as a powerful ally in addressing both the cognitive and affective dimensions of language acquisition. Future success will hinge on our ability to harness these technologies while nurturing the human connections that lie at the heart of meaningful communication.

Conclusion

This chapter has presented and critically analyzed the findings gathered from all data collection instruments, offering both qualitative and quantitative insights to insure a holistic understanding of AI influence in learners' speaking fluency enhancement. It has captured their perceptions and experiences, all indicating a positive impact of using AI in language learning. These findings support the study hypothesis and offer practical recommendations and helpful suggestions for further research and instructional strategies .

General Conclusion

This ongoing research project attempts to investigate the effectiveness of AI driven tools in promoting speaking fluency of learners in the department of English at Akli Mouhand Oulhadj University, Bouira. The primary objective of this research is to examine whether AI powered apps have the ability to solve learner's English fluency paucities. As a second objective, the study seeks to understand the difficulties encountered by students in achieving fluency when speaking English. Ultimately, the dissertation is designed to explore learners' attitudes regarding the use and integration of AI apps in language learning process. In this exploratory study, a mixed methods research approach was adopted, drawing both qualitative and quantitative perspectives. Data were gathered using a questionnaire purposively distributed and formulated to collect opinions from second group students of third-year license. The goal is to explore their attitudes towards the use of AI to achieve fluency in their spoken English. Additionally, a semi-structured interview was conducted with 10 randomly chosen students from the same group to gain insights of their personal AI usage experience ensuring extra and more detailed information. Furthermore, a pre and a post tests were employed on students of the class to evaluate their speaking development aiming to compare both their levels before and after using an AI based application for training. Their teacher as well contributed in the process of data collection, by both her observation and interview to obtain more data about students' enhancement levels and fluency development. Both qualitative and quantitative information complied from data collection instruments were analyzed using descriptive, comparative and inferential statistics.

The results revealed that the large proportion of students had used AI for the purpose of attaining oral fluency, they found it a helpful solution to face their struggles specially those who have a lack of confidence or feel uncomfortable when speaking in front of people. This shows that the majority of participants have positive perceptions regarding using AI tools in language learning process arguing that it makes it more interactive and engaging. Moreover, we have noticed from the conducted tests that some students demonstrated progress, their marks indicated notable development in their level, this was also confirmed by their teacher. Consequently, these results validate our first hypothesis.

The overall perception of AI tools was positive. Students valued the variety of exercises, the immediate and the personalized feedback feature that made learning more interesting. However, the study also identified areas for improvement. Students' disinterest was seen as

significant limitations since not all the learners demonstrated the same degree of motivation to imploy AI technologies, due to different reasons such as the unfamiliarity or a resistance to adopt new learning approaches. Moreover, the lack of access to internet presented considerable difficulties for learners in regularly using AI applications. In the other side, the most efficient AI language learning tools necessitate paid subscriptions. Additionally, the lack of devices at the university represented a significant barrier that constrained students' chances to use new methods beyond a supervised classroom setting. Another issue was the limited time assigned to oral expression sessions, only an hour and a half which frequently proved inadequate for integrating AI tools into speaking excercises and facilitating oral enhancement. Addressing these obstacles could enhance the apps' effectiveness and provide a more successful language learning experience.

The findings of this study reveal the effectiveness of AI tools in improving the speaking skill of EFL students. Based on these outcomes, we suggest several recommendations for learners and teachers to develop the use of AI apps. By following these recommendations, students can enhance their language speaking experience.

Teachers and language institutions play an important role in creating an atmosphere where AI would be able to effectively enhance speaking fluency. This entails the optimal selection and use of AI apps that align with curriculum aims and students' abilities rather than seeing the technology as an extra feature. It needs to be seamlessly integrated into education with defined objectives and expected results. As these applications are used meaningfully and regularly within the classroom, they can improve learner engagement, participation and skills.

However , to successfully implement AI tools, the teacher confidence and readiness are required. Numerous educators might be uncertain regarding the use of AI-powered Apps, particularly if they lack the technical training or familiarity with educational technology . to overcome this issue, universities ought to provide professional training by what the teachers acquire fundamental digital competencies. This training should address teaching strategies that integrate AI into speaking practices, assess student information, and using AI feedback to guide instruction. This collaboration, guidance and continuous support can assist teachers in using technology in innovative and productive ways, guaranteeing that AI develops rather than substitute teaching.

In conclusion, this research demonstrates the potential of AI apps as an effective resource for improving speaking fluency. By addressing the identified challenges and implementing the suggested improvements, AI powered tools can better support EFL learners in achieving their goals.

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Appendices

Questionnaire: The Use of Artificial Intelligence (AI) for Learners' Speaking Fluency Enhancement

Dear Participant,

This questionnaire is part of a research study conducted at the Department of English, University of Bouira. Its goal is to investigate the perceptions of EFL learners regarding the use of artificial intelligence (AI) tools to improve speaking fluency. Your responses will be kept anonymous and used only for academic purposes. Your involvement in this research is entirely voluntary. Without giving a reason or facing any repercussions, you are free to discontinue or withdraw from the study at any moment. Any information gathered prior to withdrawal will be kept private and utilized exclusively for research. It should take you about half an hour to finish this questionnaire

Thank you for your time and valuable contribution.

Instructions: Kindly mark **(×)** for the appropriate response or responses, and provide complete ones if required.

Section One: General Information

1. Age: _____
2. Gender:

   ☐ Male

   ☐ Female

3. How would you describe your current level of speaking fluency in English?

   ☐ Beginner

   ☐ Intermediate

   ☐ Advanced

Section Two: Use of Technology and AI in Learning

1. How much time do you dedicate to speaking English during each practice session?

   ☐ Less than 15 minutes ☐ 30-60 minutes

☐ 15-30 minutes ☐ More than 60 minutes

2. Have you ever practiced speaking English using digital tools or technology?

☐ Yes

☐ No

3. Are you familiar with Artificial Intelligence (AI) tools (e.g., voice assistants, chatbots, language learning apps like ELSA Speak, SpeakPal, ChatGPT, etc.)?

☐ Yes

☐ No

4. If yes, which AI tools have you used? (You may select more than one)

☐ ChatGPT

☐ ELSA Speak

☐ Duolingo's speaking features

☐ Google Assistant / Siri / Alexa

☐ Other (please specify): _____

5. How often do you practice speaking using these tools?

☐ Always

☐ Often

☐ Sometimes

☐ Rarely

☐ Never

Section Three: Perceptions Towards AI for Speaking Fluency

	Agree	Neutral	Disagree
1. Artificial intelligence (AI) techniques can enhance English-speaking fluency.			
2. Artificial intelligence systems offer real-time feedback on fluency and pronunciation.			
3. AI tools make speaking practice more interactive, motivating and engaging .			
4. Using AI tools gives me more confidence to speak in English.			
5. AI tools improve my pronunciation and intonation.			
6. AI tools can be effective in improving learners' speaking fluency.			
7. " using AI tools and apps has improved my speaking fluency"			

8. In your opinion, How frequently should AI tools be utilized in oral expression classes ?

☐ Always ☐ Sometimes

☐ Often ☐ Rarely

9. Which areas of speaking fluency do you believe AI tools can most effectively assist with? (Select all that apply)

☐ Pronunciation ☐ Grammar accuracy

☐ Vocabulary usage ☐ Fluency and coherence

☐ Speaking confidence

10. If you had to choose one method for long-term fluency improvement, which would you prefer?

☐ AI tools ☐ A combination of both

☐ Traditional methods

11. Are you open to using AI tools more frequently for speaking practice?

☐Yes, definitely ☐Not really, I prefer other methods

☐Maybe, if I see clear benefits ☐ No, I am not interested

12. How likely are you to replace some of your traditional speaking practice with AI-powered speaking exercises?

☐Very likely ☐Neutral

☐Somewhat likely ☐Unlikely

13. How has your overall speaking fluency changed due to the use of AI tools and apps

☐ positively

☐ negatively

☐ No change

4. Section Four: Challenges and Suggestions

1. What challenges have you encountered (or do you anticipate) when using AI tools for speaking practice?

☐ Lack of access to technology

☐ Low digital literacy

☐ Inaccurate feedback from AI

☐ Preference for human interaction

☐ Other (please specify): _____

2. Would you recommend the integration of AI tools into English-speaking classes at the university? Why or why not ?

_____

_____

3. Do you have any suggestions for improving the use of AI in enhancing speaking fluency ?

_____

_____

Focus Group Main Questions/Answers

1. **How would you assess your current level of English-speaking proficiency (beginner, intermediate, or advanced), and what factors contribute to your self-evaluation?**

- "I would rate my English speaking skills at a beginner level. I struggle significantly with pronunciation and vocabulary retention, and my lack of confidence further hinders my progress."
- "I consider myself an intermediate speaker. While I can speak fluently when practicing alone, I face challenges in real conversations—such as forgetting words, mixing tenses, or mumbling—especially under pressure."
- "I classify my proficiency as advanced. I communicate effectively in most settings, though I occasionally mispronounce unfamiliar or complex words."
- "My speaking ability is at an average level. I have a reasonable grasp of vocabulary and grammatical structures, but there is still room for improvement in fluency and accuracy."
- "I would describe my English proficiency as intermediate. While I can communicate effectively in prepared situations, I sometimes face challenges in spontaneous conversations, particularly when speaking for extended periods. My main difficulties include finding the right vocabulary and maintaining confidence in my pronunciation during unplanned discussions."
- I think my English is above average. It's not very high, but it's more than just average. However, when it comes to speaking, I feel that I'm below average. My speaking skills are not very strong. The main problem is that although I have a good vocabulary, when I want to speak to someone, the words don't come out. I struggle to express myself clearly in conversation. I think I just need more practice speaking in front of others. For example, my friend is excellent at English, but he is shy. He just needs to step out of his comfort zone, and I want to help him. I used to be worse than him, so I understand.

- Yes, I think it’s related to public speaking anxiety. It’s not that I’m truly afraid, but when I speak in front of people, the words disappear. Even though I can write well and understand English, speaking in front of others is challenging. So, yes, I think my main issue is speaking confidently in public.
- I would say my speaking is at the intermediate level. I struggle with a limited vocabulary, which makes it hard to express myself fully. I also make grammar mistakes, and I feel nervous speaking in front of people who are fluent in English. That fear often holds me back.

2. **What are your perspectives on utilizing AI-based tools to enhance English language skills?**
    - "AI tools are highly beneficial for improving English, particularly in pronunciation and vocabulary. They provide instant corrections, helping learners understand new words and refine their speaking skills efficiently."
    - "I have used Duolingo, which significantly enhanced my vocabulary and fluency. However, for grammar, I still find human teachers more effective, as AI alone wasn’t sufficient in that aspect."
    - "Honestly, AI has been a game-changer for me in learning English. I regularly use language applications, and each one helps me strengthen different skills, whether it's speaking, listening, or grammar."
    - "I don’t believe AI adds much value on its own. Consistent practice—whether through conversation, writing, or other methods—is what truly leads to improvement."
    - "I occasionally use AI tools to enhance my English proficiency, as they assist me in expanding my vocabulary and identifying/correcting errors.
    - I haven’t used AI much to improve my speaking—maybe just once or twice, but the app didn’t work very well. I know there are different options, so if one app doesn’t work, I should try another. I haven’t tried using AI online yet, but I think I should. I’ve used some apps to help with grammar and punctuation, and they’ve been helpful.
    - Yes, I have. AI has been very helpful. It’s accessible anytime and anywhere, which makes it easy to practice. Some tools even listen to your speaking and give you feedback

on what to fix, which is really useful. I’m still in the process of improving, but I’ve seen real progress. My speaking has definitely improved, even though I still have work to do.

What are your opinions on integrating AI technology into oral communication classes?

- "I support the use of AI in language learning. It benefits both students and teachers by providing additional practice and support, enhancing the overall learning experience."
- "I do not favor using AI in classroom settings. Since AI can be accessed at home, I believe class time should focus on real-life interactions, teacher feedback, and personalized guidance. Relying on AI during lessons feels like an inefficient use of valuable learning time."
- "I agree with using AI as a supplementary aid, but only within a structured pedagogical framework. Without proper oversight, excessive dependence on AI could dominate the learning process and reduce productivity rather than enhance it."
- Traditional Methods for Speaking Skills:
- "I strongly advocate for traditional methods to improve speaking skills, such as reading aloud and engaging in real-life conversations. These approaches are far more effective for achieving fluency, whereas excessive reliance on AI feels like a waste of time."
- I maintain a positive view of AI integration both inside and outside the classroom, as it effectively helps diagnose learning gaps, provides targeted improvements, and offers access to rich, engaging topics for practice."
- I think using AI in the classroom can help correct pronunciation and improve sentence structure. Outside of class, AI can suggest topics to talk about and help improve pronunciation and fluency through practice. It can be a useful tool for both teachers and learners.
- I think AI is very helpful, especially outside the classroom. It allows you to learn freely and comfortably, without the fear of being judged. You can make mistakes, get feedback, and fix them on your own terms. That freedom really boosts confidence