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INTEGRATING ARTIFICIAL INTELLIGENCE IN THE FLIPPED CLASSROOM APPROACH

DISSERTATION

MESTRADO EM DIDÁTICA DO INGLÊS

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Acknowledgements

"No man is an island."

(John Donne)

As I reflect on my journey, three powerful mottos emerge as guiding stars: "There is always room for improvement" (Anonymous), "If you want to go fast, go alone. If you want to go far, go together" (African Proverb), and "Progress is not achieved by luck or accident, but by working on yourself daily" (Epictetus).

This Master's in English Teaching has helped me become a better teacher, nurtured my thirst for knowledge and also helped me develop new skills thanks to the collaboration and valuable input of those who also embarked on this exciting yet challenging journey, considering that most of us are full-time teachers and are seriously committed to delivering the best of us in all areas of our lives.

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Nélson José Ponte Rodrigues

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Declaro ter atuado com integridade na elaboração da presente dissertação.
Confirmo que em todo o trabalho não recorri à prática de plágio ou a qualquer forma de falsificação de resultados.

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Universidade Aberta, 20 de dezembro de 2024

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Resumo

Integração da Inteligência Artificial na abordagem da sala de aula invertida

Esta dissertação investiga uma questão central: Como é que a Inteligência Artificial (IA) pode melhorar a aprendizagem da língua inglesa de alunos adultos falantes da língua portuguesa numa sala de aula invertida (*Flipped Classroom* em inglês)?

Este estudo tem como objetivo compreender o impacto das ferramentas de IA na motivação, no desempenho e na aprendizagem de alunos adultos quando integradas no ensino de línguas.

Ao utilizar uma abordagem que envolve métodos de pesquisa mistos para a obtenção de dados quantitativos e qualitativos antes e após a experiência, esta investigação pretende avaliar o impacto do uso da IA em adultos nas atividades de compreensão do oral, leitura, expressão escrita e produção oral, em comparação com os métodos tradicionais.

Com base nas teorias construtivistas de Dewey (1929), Bruner (1961), Vygotsky (1962) e Piaget (1971), que enfatizam a importância do papel ativo dos alunos na aprendizagem, a dissertação examina a forma como as ferramentas de IA, como o ChatGPT e o Gemini, fornecem feedback personalizado e em tempo real e apoiam a autonomia dos alunos (Von Glasersfeld, 1995; Jonassen, 1994).

O modelo de sala de aula invertida, destacado por Bergmann e Sams (2012) como uma abordagem pedagógica eficaz, serve de enquadramento para a implementação de ferramentas de IA que permitam a preparação dos alunos para as aulas seguintes e a aprendizagem ativa durante a aula.

Os resultados indicam que a integração da IA numa sala de aula invertida pode aumentar o envolvimento dos alunos, aumentar o ritmo de aprendizagem e reforçar a motivação, fornecendo-lhes feedback adaptado, conferindo-lhes, assim, uma componente prática personalizada. No entanto, há limitações, incluindo a possível dependência excessiva da IA, preocupações relativamente à redução da interação interpessoal e as dificuldades que alguns alunos enfrentam ao usar tecnologia (Lin et al., 2017; Pokrivcakova, 2019). Apesar desses desafios, a natureza adaptativa da IA alinha-se bem com as necessidades dos alunos adultos que procuram uma aprendizagem flexível e autodirigida, sugerindo que a IA pode

complementar os métodos tradicionais para assim criarem aulas mais dinâmicas e interativas.

A dissertação termina recomendando mais investigação no aspeto ético da IA na educação, particularmente em torno da privacidade dos dados e do impacto na relação professor-aluno. Estudos futuros devem também explorar a aplicabilidade da IA em diferentes níveis linguísticos e os seus efeitos a longo prazo na retenção da língua e na confiança dos alunos. Esta investigação contribui para a crescente literatura sobre a IA no ensino das línguas, oferecendo perspetivas práticas sobre a forma como os professores de línguas podem integrar a IA de forma responsável nas suas aulas de modo a enriquecerem o ambiente de aprendizagem dos alunos adultos.

Quando devidamente utilizada, a IA consegue oferecer apoio personalizado e feedback em tempo real, tornando a aprendizagem mais cativante e eficaz tanto para os alunos como para os professores. Ao explorar esta combinação, o estudo procura desenvolver experiências de aprendizagem de línguas mais eficientes e bem-sucedidas para estudantes adultos que procuram aulas mais dinâmicas e menos centradas no professor. É essencial optar por novos métodos e ferramentas de ensino que tornem os alunos mais ativos e participativos na sala de aula e em casa. Graças à IA, é possível criar mais ambientes de interação entre os alunos e o conteúdo abordado, bem como dar-lhes mais autonomia.

Palavras-chave: Inteligência Artificial, sala de aula invertida, aprendizagem de línguas, teoria construtivista, educação de adultos, feedback personalizado, autonomia do aluno.

Abstract

Integrating Artificial Intelligence in the Flipped Classroom Approach

This dissertation investigates one central question: How can Artificial Intelligence (AI) enhance adult English language learning in a flipped classroom setting for Portuguese-speaking learners?

This study aims to understand how AI tools impact learner motivation, performance, and acquisition outcomes when integrated into language education.

By employing a mixed-methods approach that includes both quantitative and qualitative data from pre- and post-intervention assessments, this research evaluates adult students' learning with AI-driven tasks in listening, reading, writing, and speaking activities compared to traditional methods.

Building on the constructivist theories of Dewey (1929), Bruner (1961), Vygotsky (1962), and Piaget (1971), which emphasise active learner engagement, the dissertation examines how AI tools such as ChatGPT and Gemini provide personalised, real-time feedback and support learners' autonomy (Von Glasersfeld, 1995; Jonassen, 1994).

The flipped classroom model, highlighted by Bergmann and Sams (2012) as an effective pedagogical approach, serves as the framework for implementing AI tools to allow pre-class preparation and in-class active learning.

The findings indicate that AI integration in a flipped classroom setting can boost engagement, increase the learning pace, and enhance motivation by providing tailored feedback and enabling personalised practice. However, limitations include the potential for over-reliance on AI, concerns about reduced interpersonal interaction, and the challenges some learners face with technology (Lin et al., 2017; Pokrivcakova, 2019). Despite these challenges, AI's adaptive learning capabilities align well with adult learners' needs for flexible, self-directed learning, suggesting that AI can complement traditional methods to create a more dynamic, interactive classroom experience.

The dissertation concludes by recommending further research to address the ethical considerations of AI in education, particularly around data privacy and the impact on teacher-student relationships. Future studies should also explore AI's applicability across different language levels and its long-term effects on language retention and learner

confidence. This research contributes to the growing body of literature on AI in language education, offering practical insights into how educators can responsibly integrate AI to enrich the learning environment for adult language learners.

When used correctly, AI can offer personalised support and real-time feedback, making learning more engaging and effective for both students and teachers. By exploiting this combination, the study seeks to develop more efficient and successful language learning experiences for adult students looking for more dynamic lessons that are less teacher-centred. Opting for new teaching methods and tools that make students more active and participative in the classroom and at home is essential. Thanks to AI, it is possible to create more environments for interaction between students and the content covered and give them more autonomy.

Keywords: Artificial Intelligence, flipped classroom, language learning, constructivist theory, adult education, personalized feedback, learner autonomy.

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AI – Artificial Intelligence

AIED – AI in Education

CEFR – The Common European Framework of Reference for Languages

EFL – English as a Foreign Language

ESL – English as a Second Language

FCM – The Flipped Classroom Model

L2 – Second Language

Introduction

1. Objectives

This dissertation aims to investigate the benefits and weaknesses of integrating artificial intelligence (AI) in the flipped classroom teaching approach. In today's education, it is paramount to carefully examine AI's real impact on students' motivation, engagement, and overall performance.

This study intends to shed some light on how AI-based learning tools can influence adult language learners when learning a foreign language and its impact on their learning journey and outcomes. Additionally, it examines the participants' initial learning strategies and beliefs before the experiment. Following the experiment, the research will seek to comprehend the efficacy of AI in enhancing the learners' experience. Moreover, it will delve into the advantages, limitations, and concerns surrounding the use of AI in teaching, with a particular focus on data analysis and reflection. Ultimately, the research aims to provide valuable insights into how educators and students can benefit from incorporating AI into a flipped classroom setting. Additionally, it will consider relevant literature to support the findings whenever necessary.

2. Statement of the problem

Even though some scholars may not reach a favourable consensus on the use of AI, I believe it has tremendous potential to accelerate language learning. Furthermore, it is fundamental to keep pace with today's language learners' needs and motivations. Most of my adult students prefer faster feedback, more autonomy, greater flexibility, and more control over their time, and that is why I decided to start using AI in my classes.

After considering AI's potential in language teaching and its relatively early stage of development, especially in Portugal, I decided to start exploring its numerous possibilities in my English classes.

Drawing upon my teaching experience, the flipped classroom method plays a vital role in teaching a foreign language, as it has proven to be an effective and reliable way to help adult students learn more rapidly and efficiently. It significantly differs from other teaching approaches because it encourages students to acquire knowledge before each class. When students take responsibility for their learning and seek information beyond the classroom setting, they are more likely to come to class with a greater understanding and

more questions. This approach leads to more visible results compared to passive listening to the teacher or expecting the teacher to cover all the topics in class. By doing so, teachers are promoting student-driven learning. Hence, when students are encouraged to come prepared for class, they engage in more active study and arrive with questions. As a result, teachers can effectively harness students' full potential.

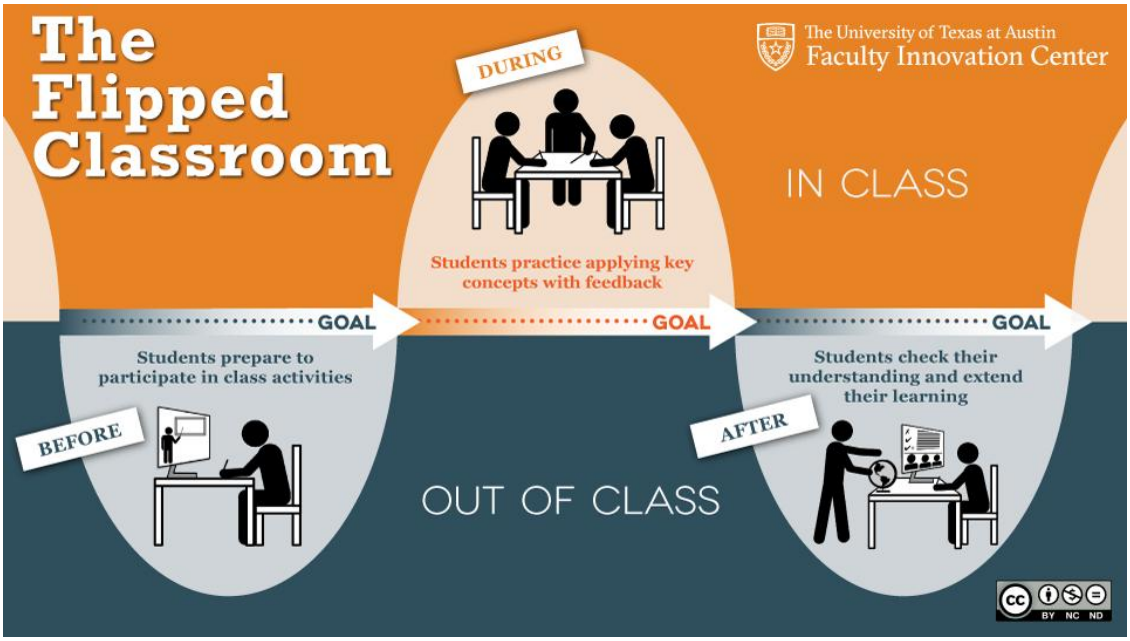

Figure: 1: The flipped classroom model 1

The University of Texas at Austin, Centre for Teaching and Learning. (n.d.). *The flipped classroom* [Infographic]. Retrieved from [https://ctl.utexas.edu/instructional-strategies/flipped-classroom]

One advantage of incorporating AI in language teaching is its potential to enhance student motivation and understanding. With AI-powered tools, students can receive personalised feedback more quickly, and resources can be adapted to fit their learning styles. This immediate feedback boosts their motivation and increases their engagement in the learning process.

Furthermore, AI can significantly improve students' performance and outcomes. AI tools offer additional support in areas where students usually struggle, helping them improve their language skills more efficiently than traditional teaching methods. Additionally, these tools can provide valuable data for teachers to identify areas where students need additional support.

Although AI presents many benefits, teachers must also address potential drawbacks. A significant concern is the possible loss of personal touch in the learning process due to the inadequate use of AI tools. Unsurprisingly, some scholars, linguists, and teachers worry that over-reliance on AI may diminish the crucial human interaction needed in language learning and threaten students' reliability in their results.

Language education is fundamentally a collaborative endeavour that involves effective communication between language facilitators and learners. Notwithstanding, human interaction in language acquisition can coexist with AI tools to provide learners with more interactive learning experiences. It is important to note that integrating AI tools into language instruction should always be thoughtfully balanced with preserving meaningful human interaction and feedback.

Finding a great range of AI tools that align with the diverse needs of language learners is equally challenging. Accomplishing this objective requires comprehending the learners' needs and a prior study of the learners' learning styles and main difficulties, as well as helping those who feel uncomfortable using technologies, including AI.

Moreover, it is essential to ensure that AI tools complement and work alongside traditional teaching methods, such as peer work and group brainstorming, to maintain the vital human interaction in language learning.

In late 2022, OpenAI introduced ChatGPT, a cutting-edge conversational AI tool that stirred quite a commotion within the educational realm due to its remarkable capacity to emulate human-like responses in student assignments.

Understandably, educational institutions are worried about students' potential misuse of these AI chatbots. Their concerns revolve around two main issues: the possibility of students relying excessively on such tools for their written tasks or passing off machine-generated content as their own work.

Regrettably, current detection mechanisms lack reliability, yielding false negatives (failing to detect plagiarism) and false positives (flagging original work incorrectly). This scenario creates an atmosphere of uncertainty among educators, potentially undermining the trust in the student-teacher relationship.

3. Relevance of the experiment

In today's globalised and ever-changing world, it is of the utmost importance to understand and test how AI in the flipped classroom approach can boost students' motivation, contribute to their participation, and effectively foster faster language learning.

From my perspective and based on relevant literature, this combination can be a game-changer for learners and teachers, ensuring continuous guidance and maintaining students' motivation and focus. Exploring the synergy between AI and the flipped classroom approach can make language learning more efficient and meaningful to most students.

The integration of AI in the flipped classroom approach has the potential to modernise and improve teaching methods and learning tools. Thus, AI can enhance learning outcomes by providing personalised support, instant feedback, and a more engaging learning experience. However, it is crucial to acknowledge that over-reliance on AI may take a heavy toll on learning.

In summary, preparing and exposing students to AI is as essential as ensuring regular teacher training. These procedures will permit both teachers and students to explore AI effectively, confidently, and responsibly, maximising its benefits while minimising its drawbacks. This balanced approach ensures the responsible and effective use of AI tools and software in education.

AI in education makes the learning experience more appealing, versatile and adaptable to meet students' needs and address their difficulties beyond the classroom setting. It also has the ability to offer personalised feedback, which can help students achieve better and faster results. Yet, it is vital to remember that human teachers are pivotal in providing emotional support, interpersonal skills development, creative and thought-provoking questions, and mentorship, which AI cannot replicate. Furthermore, by combining AI-assisted tools with traditional methods, teachers can obtain precious insights from both to better understand, adapt, and explore their learners' needs and interests and address their struggles more rapidly.

When teachers incorporate AI into the learning process, it provides students with more personalised support and instant feedback, making the learning process more engaging and interactive, and it allows students to notice their progress more quickly and frequently.

4. Strategies

During this experiment, the following strategies will be applied to help students understand the purpose of this experiment and its importance on their learning journey:

- Explain the concept behind the flipped classroom and its long-term benefits;
- List all the steps/procedures within the experiment and their contribution to enhancing their learning experience;
- Elucidate what Artificial Intelligence is and how it can positively impact their learning when used appropriately;
- Show how AI and the flipped classroom model can be combined to make their learning more effective, engaging and appealing;
- Demonstrate in class how AI tools can provide real-time responses and allow them to practise the four pillars of a language: listening, reading, writing and speaking;
- Display the upsides and warn about the downsides and risks of misusing AI tools;
- Compare a more traditional approach with an AI-oriented class, drawing their attention to the benefits and limitations of both approaches whenever necessary;
- Create an environment where learners feel supported, motivated and eager to participate.

5. Research questions

AI has the potential to revolutionise language teaching by providing personalised feedback and a significant number of resources to enhance students' outcomes. Thus, these tools can improve student motivation, engagement, overall performance and outcomes. However, we must carefully consider and address the possible drawbacks, such as plagiarism and overreliance on AI.

Hence, the dissertation questions for this study are as follows:

- What is the impact of AI on language learners' motivation, performance, and learning outcomes in conjunction with the flipped classroom approach? (That was verified by asking a group of students to perform similar tasks with and without AI tools.)
- What learning strategies and beliefs do language learners (control and experimental group) have before conducting the experiment?

- What do language learners think about the efficacy of AI tools in conjunction with the flipped classroom approach in improving their learning experience? (after the experiment)
- When using AI in teaching, what are the significant advantages, limitations and primary concerns regarding validity and reliability? (data analysis and reflection)
- How can teachers and students benefit from incorporating AI into a flipped classroom approach? (literature to support my findings/conclusions after the experiment)

6. Layout

This dissertation is divided into nine sections and structured as follows:

Introduction: In the first section, the objectives, statement of the problem, relevance of the experiment, strategies, research questions, and outline are presented to demonstrate the importance of this experiment, procedures, and methods to be applied.

Chapter 1 – Theoretical framework: The first chapter covers three main topics, ranging from relevant literature for this experiment to the benefits of AI in the flipped classroom approach, as well as the limitations and concerns surrounding the use of AI in education.

Chapter 2 – The context of the study: The second chapter focuses on the context of the experiment and provides an overview of the participants' background, motivations, and aspirations.

Chapter 3 – Methodology: The third chapter explores why and how quantitative and qualitative research methods were used in the experiment to add factual and reliable data and ensure trustworthy findings.

Chapter 4 – Initial questionnaire findings: The fourth chapter presents comprehensive data analysis using pie and horizontal bar charts. The charts help illustrate the students' background, learning strategies, and points of view regarding the flipped classroom model, as well as their thoughts and expectations concerning the integration of AI technology in the flipped classroom approach.

Chapter 5 – The experiment: This chapter describes the experiment, which is divided into two parts for each of the four learning skills (listening, reading, writing, and speaking). The first part involves AI interference in all activities, while the second uses AI to facilitate learning. The experiment assesses how AI tools can positively affect students' motivation, participation, and results. The drawbacks of AI were also considered to prevent students from misusing it, which can hinder their success. Insights were jotted down during the experiment, and observation grids with the advantages, disadvantages, limitations, and aspects to consider in future classes were reflected upon at the end of each experiment to ensure unbiased and reliable findings.

Chapter 6 – The interview: Before concluding the study, open-ended and close-ended questions were asked in this chapter to strengthen the findings and provide vital insights into identifying the pros and cons of all activities and their limitations.

Chapter 7 – Reflection on findings: In this chapter, all the gathered data is dissected and explored using relevant literature on AI in education and its role in the flipped classroom model. Personal insights and written notes from the teaching experience with and without AI interference are essential to enrich the ultimate findings. Other pertinent considerations regarding language learning will be included to complement my research study. Several factors, not only technological, interfere with the learning process and directly affect learners' results.

Conclusion: In the final section, the main findings and insights are summarised, including relevant literature to support the applicability and pertinence of the experiment. This research study, which includes a thorough study of the use of AI and how its integration with the flipped classroom contributes to more engaging and fruitful language classes, is a starting point for further exploration. While it may not include all the desired answers or address all the implications the education community seeks, it highlights the need for more research in this area. At this early yet fast stage of AI, it is nearly impossible to address all the issues surrounding this technology, especially its legal and ethical aspects.

The core of this work is to analyse and point out the advantages and disadvantages of AI when teaching a second or foreign language to adult learners,

paving the way for future research in the field of AI in language teaching and learning.

Chapter 1. Theoretical Framework

1.1. Constructivist theory

As a teacher, I have always looked for the most effective ways to deliver engaging lessons that promote learning in the classroom and beyond.

This study is grounded in Constructivism, a psychological theory that showcases the importance of active learner engagement and explains how people acquire knowledge.

Deriving from the works of Dewey (1929), Bruner (1961), Vygotsky (1962) and Piaget (1971), constructivist learning theory asserts that learning is a mental construction process in which new information is integrated with prior knowledge. This approach encourages learners to cultivate curiosity and actively pursue knowledge. Thus, learners build their understanding of reality by continuously updating their mental models with new information. Constructivism also acknowledges that a person's context and beliefs matter because they affect learning.

Von Glasersfeld (1995) suggests that learning entails more than just reacting to stimuli as it involves self-regulation and developing conceptual structures through thinking and making abstractions. According to Jonassen (1994), Constructivism does not require students to start from scratch. Instead, it taps into their natural curiosity about the world. Students do not need to reinvent everything. In other words, they just need to apply existing knowledge, make hypotheses, test ideas, and draw conclusions from real-world experiences. Although Constructivism may have various interpretations, it is commonly understood that learners create knowledge from their experiences.

According to Solak (2024), AI and ChatGPT, in particular, can support a constructivist approach by delivering interactive and adaptive language learning experiences. "Learners engage in meaningful conversations, receive immediate feedback, and adapt their understanding based on real-time interactions with the AI" (p. 356). Bandura (1976) stated that social interactions play a significant role in learning. Artificial intelligence interacts with users through conversational agents, such as chatbots and voice assistants, to answer questions and collaborate on tasks. During these interactions, users tend to view them as social, prompting them to adjust their communication style accordingly. Despite being artificial, this interaction closely resembles human communication.

Like Constructivism, the flipped classroom model encourages students to be active learners and prepare themselves for the next class. This approach allows students to explore

new content at their own pace, fostering deeper understanding and critical thinking, talking responsibility and assuming a pivotal role in their learning journey. By shifting the traditional lecture format to a more interactive and collaborative setting in the classroom, teachers can dedicate class time to problem-solving, discussions, and hands-on activities, making the learning process more enjoyable and efficient. This pedagogical shift ultimately benefits students and teachers, as students come prepared with questions and a foundational knowledge base. Classes become much more interesting and productive when there are more interactions among students with the teacher's supervision and guidance when needed. It is crucial to teach students the importance of autonomous study while giving them different strategies to solve habitual problems and tools to research, explore, summarise and identify reliable information to help them understand new topics. Everyone wins!

Considering Wu and Wang's work (2021), it is possible to easily observe the undeniable potential of the flipped classroom model in language teaching and learning:

> A flipped classroom or inverted classroom is such an innovation which can enable learners to develop critical thinking skills, and master the method of absorbing a large amount of information by allowing students to participate in an active learning process. Reading and understanding are carried out at home, and classroom time is used for high-level learning, such as analysis, evaluation, and application of basic information (p. 2).

As a result, teachers can allocate more time to refining their teaching strategies, developing high-quality instructional materials, and designing substantive in-class or forum discussions. Having been instructed to prepare for the upcoming class, students are empowered to take a proactive role in their learning. Today's classes should be student-centred, equipping learners with a proactive mindset, tools, and all the necessary strategies to explore new and prior content. In my experience as both a student and a teacher, I have observed that when classes are teacher-centred, students often encounter several challenges. They tend to struggle to achieve tangible results, initially lack motivation, lose confidence, become overly self-conscious, and feel frustrated because they perceive a lack of progress. As language teachers, it is crucial to help our learners recognise and celebrate their progress,

no matter how small it may seem, as this is a key factor in keeping learners encouraged and motivated.

Traditional teaching approaches focus primarily on information transmission, which hinders learner engagement and critical thinking. Time limitations and exam pressure may drive teachers to rote learning methods, prioritising memorisation over deeper learning.

The flipped classroom model and its dynamic approach allow teachers to use class time for interactive activities and personalised support by pushing content delivery outside the classroom setting. This shift allows learners to learn at their own pace and explore content in advance, which promotes self-directed learning and deeper comprehension.

1.2. The benefits of AI in the flipped classroom approach

The experiment is based on using AI in the flipped classroom approach, which considers and follows the principles of active learning and integrating technology. Bergmann & Sams (2012, p. 85) advocate that leveraging modern technology can help teachers provide more valuable feedback to their students and make their classes more engaging and refreshing.

Research in the field of education has shown that FCM (the Flipped Classroom Model), combined with blended learning, can effectively motivate students and improve their learning outcomes (Sergis et al., 2017). In addition, Sergis et al. state that FCM is a practical and successful teaching strategy that promotes students' independence:

> Regarding students' need for Autonomy, the FCM effectively supported students' need to be engaged with tasks in an autonomous manner within a context that is relevant to them. It is argued that this level of autonomy was allowed in the learning environments created by the FCM since students could invest more time in hands-on activities and peer-/teacher- collaboration instead of being exposed to teacher-led lecturing, which would be restricting in terms of autonomy. (…)
> Additionally, it is argued that the provision of scaffolding by their teacher and the engagement with hands-on practices contributed to their enhanced sense of

> competence, making them more confident to engage and complete the challenges of the learning process. (Sergis et al., 2017, pp. 375 and 377)

Also, studies by Bishop and Verleger (2012), Giannakos, Krogstie, and Chrisochoides (2014), and Lo and Hew (2017) have explored FCM's potential across various subjects and grade levels.

Most research indicates that FCM can benefit both teachers and students. For example, Aidinopoulou and Sampson (2017) and Kostaris, Sergis, Sampson, Giannakos, and Pelliccione (2017) found that FCM can enhance teaching and learning conditions. Additionally, Kong (2014) showed that FCM can improve cognitive learning outcomes, while Tanner and Scott (2015) highlighted its significant positive impact on skill development, instilling optimism about its potential. Also, Baepler, Walker, and Driessen (2014) and Sahin, Cavlazoglu, and Zeytuncu (2015) demonstrated that FCM could boost student motivation.

Therefore, it is vital that educators consider and use new teaching methods, such as the flipped classroom model (FCM) to promote both collaborative and independent learning and improve learners' performance.

In Wu and Wang's own words (2021), "with the help of f1ipped classroom teaching, students' English autonomous learning ability has been significantly improved, and the difference is significant" (p. 6).

By incorporating AI technology, researchers and educators have observed the remarkable benefits of AI in the Flipped Classroom Model (FCM). This powerful combination has led to a noticeable increase in student motivation, engagement, interest, performance and results. The alignment of AI with the principles of personalised learning and adaptive instruction offers new scenarios for exploring the synergies between pedagogical approaches and technology in language education.

AI is a powerful instrument for language learning and education, allowing learners to improve their language learning performance (Zhang & Zou, 2020; Su et al., 2023; Zhang, 2022).

For example, Duolingo, a popular AI-powered language learning application, offers immersive speaking exercises and incorporates gamification elements to spark learners'

interest, track their progress and provide rewards to encourage consistent practice (Li & Bonk, 2023). Additionally, Duolingo offers interactive group activities and discussions, simulating real-world language use and further enhancing speaking skills (Shortt et al., 2021). Their research highlights AI's substantial role in improving language learning, especially refining speaking skills.

Integrating AI technologies into Duolingo is a watershed moment in language learning because it offers learners continuous, entertaining and customised practice opportunities. Duolingo's speaking activities and real-time feedback urge learners to express themselves in the target language, honing their pronunciation and spoken language skills (Shortt et al., 2021).

By combining AI-powered technology with interactive features, Duolingo and other similar apps make language learning more entertaining and hands-on for learners of all levels.

Drawing upon Kiao and Zhao's work (2023), "it is plausible that learners' engagement with AI in more stimulating and interactive ways played a role in enhancing their speaking skills" (p. 9).

Pandarova et al. (2019) have explored the potential of integrating AI into language teaching by developing a system that uses advanced algorithms to suggest appropriate learning materials based on a student's proficiency, preferences, and individual needs. For instance, this can be accomplished by adapting the difficulty of grammar content to match students' language abilities. Consequently, this system enables learners to learn at their own pace, which helps those who may need more time to learn and require further practice.

Hybrid learning models, blending in-person and online instruction, offer flexibility for diverse learners with different learning styles, needs and competencies.

In conclusion, the three main benefits of integrating AI in a flipped classroom setting are:

- Increased student autonomy: AI-powered tools empower learners to take control of their learning, access materials at their own pace and encourage autonomous learning.
- Personalised learning: AI algorithms can tailor instruction to individual needs and preferences, optimising learning outcomes and raising the students' interest and level of engagement as it is adapted to meet their needs or goals.

- Optimised Classroom Time: By shifting content delivery traditionally taught in class to a more autonomous approach that encourages students to prepare themselves for the next class, teachers have more time and energy to prepare and create interactive and collaborative activities for the classroom.

With the aid of AI software, learners can take matters into their own hands and obtain feedback in real time. They are more likely to become avid knowledge seekers, revisit learning materials and act upon their learning. This behaviour change dramatically increases their chances of enjoying, understanding, and retaining the concepts they are studying or putting into practice.

Social cognitive theory (Bandura, 1989) asserts that learning occurs by observing and imitating others. In AI-supported learning environments, learners engage in vicarious learning, in which they can see AI systems exhibiting self-regulatory behaviours like providing adaptive feedback and guidance on goal-setting, for example. Learners, therefore, can build their self-regulation skills. After observing such behaviours, learners can integrate and replicate self-regulation measures, strengthening their self-regulation skills.

Beyond that, AI technologies offer benefits such as adaptive learning algorithms and real-time data analysis, allowing students to receive quick feedback and track their progress. The rapid feedback enables students to evaluate their progress, identify areas for improvement, and adjust their learning strategies (Qiao & Zhao, 2023, p. 10).

Moreover, Qiao and Zhao (2023) add that AI can enhance language learning by providing personalized feedback, adaptive exercises, and engaging communicative activities. This support helps learners develop self-regulation skills, monitor progress, and improve their speaking proficiency (among other skills):

> AI technologies can support learners in regulating their learning processes, setting goals, monitoring their progress, and making necessary adjustments. Having offered personalized feedback and adaptive exercises, AI-based instruction empowers learners to take control of their learning and develop metacognitive strategies that enhance their speaking skills. (…) Additionally, the engaging nature of the AI environment's communicative speaking activities is likely to enhance EFL students' speaking proficiency and foster their enthusiasm for further language learning endeavours. (p. 11)

Nevertheless, research on AI integration in language teaching has revealed advantages and hindrances. Although AI has the potential to offer personalised learning and adaptability to students' needs, over-relying on AI language tools is still a slippery slope. Therefore, it is urgent to recognise that AI in language teaching is a continuously evolving field that requires ongoing improvement and addressing challenges to harness its potential fully.

Even though Zawacki-Richter et al. (2019) point out that AI in Education (AIED) has existed for approximately three decades, educators still face challenges when exploring the full pedagogical potential of AI. Moreover, understanding its impact on meaningful teaching and learning remains an ongoing and complex task.

1.3. Limitations and concerns

Despite the advantages of using AI in language learning, concerns persist regarding its reliability. In other words, teachers, scholars, and students are concerned about whether AI can consistently provide accurate and reliable assistance in language learning and the risks involved in misusing AI. Moreover, Lin et al. (2017) discovered that people with little experience using e-learning tools were less satisfied with Intelligent Tutoring Systems (ITS) and had negative perceptions of them compared to traditional technology. Similarly, Pokrivcakova (2019) identified identical challenges and found that teachers' lack of experience with Information Communication Technology (ICT) made them reluctant to use AI-related technologies. It is necessary to improve AI-enhanced learning systems that offer superior teaching and learning experiences and foster positive attitudes so that teachers and learners can reach common ground. Because of this reality, it is also essential to conduct teacher training programmes to help educators understand the potential benefits of AI in language learning.

Also, Qiao and Zhao (2023, p. 12) point out the importance of ongoing research on the use of AI in language learning since it is still necessary to compare the effectiveness of AI technologies versus human instruction in reducing learners' anxiety and improving conversational fluency. In fact, this issue, among others, may arise in the future when using AI to accelerate and facilitate L2 learning.

At this point, the five main drawbacks of integrating AI in a flipped classroom setting are:

- Technical barriers: Ensuring access to technology and a fast internet connection.
- Teacher training: Equipping teachers with the necessary skills to effectively integrate AI tools.
- Student readiness: Preparing learners to embrace technology and independent learning.
- Student's overreliance on AI tools: By depending on AI to do their school assignments, students miss out on opportunities to enhance their problem-solving and critical thinking skills. Furthermore, it is quite simple to plagiarise or credit AI's content as their own, lowering the value of original thinking and diligent and honest effort.
- Ethical Considerations: Data privacy and algorithmic bias must be carefully addressed when implementing AI-powered tools in the educational sphere.

Future research should continue exploring the integration of AI-powered tools in language learning in order to unlock the remarkable potential of the flipped classroom model. Language translation apps, speech recognition software, and adaptive learning platforms usually offer real-time adjustments and feedback, as well as adapting content and difficulty levels based on user progress and preferences. This adaptive nature of AI can facilitate learning and make it more engaging and suitable to meet each learner's unique needs and objectives, ideally taking into account the user's difficulties.

Despite all AI limitations and pitfalls, teachers can still use it responsibly and harness the flipped classroom model's full potential to create engaging, memorable and practical language learning experiences for adult learners.

Chapter 2. The Context of the Study

Without a shadow of a doubt, teaching a language has always been a complex process, and modern technology has completely revolutionised how we perceive language education these days. Incorporating artificial intelligence (AI) in teaching is among the latest trends in language teaching. Yet, probable challenges must be considered before implementing AI tools in language teaching or learning.

The participants in this study, aged between 18 and 60, were Portuguese and Brazilian students attending the A1 English Course at ISTA, Instituto de Artes e Letras de Albufeira, a language school in Albufeira. Our school prides itself on providing a supportive learning environment and additional resources, including a learning platform and a weekly study plan to help learners stay on the right track beyond the classroom setting. Like most language courses in this school, this course took place twice a week, from 7:00 pm to 9.00 pm, on Tuesdays and Thursdays. Classes are primarily synchronous but require asynchronous work to ensure visible progress and meet this level's requirements, always considering the Common European Framework of Reference for Languages (CEFR) and Cambridge standards for teaching English as a foreign language/second language (EFL/ESL).

All language courses at this school have been designed for adult learners who speak Portuguese. Most of our students want to improve their English to understand and express themselves in English, considering that most hotels and companies in the Algarve consider English an essential prerequisite to work in this region. Generally, most students in these beginner courses work in the tourist and catering industries and want to learn English mainly for work reasons or to seek personal language development at times.

The 4-week experiment explored both the theoretical and practical aspects of using AI-powered tools within the flipped classroom model. In order to give participants a broader overview, there was an explanatory session the week before in which the objectives were presented, and students had to formalise their intention to participate by filling in a consent form. After that, they had the opportunity to ask questions and seek clarification on how the experiment would be conducted and what they could expect. To make the experiment more trustworthy and complement my findings, the collected data of the research encompasses not only information from observation in class but also from the initial questionnaire and the interview that marked the end of the experiment. During the first weeks of classes, a brief lecture, mostly preparatory, provided participants with an overview of the background and

context of what AI is and why it matters in today's education, especially in learning a foreign language.

Ten students initially completed the questionnaire, but only seven completed the experiment. Unfortunately, three students abandoned the experiment because they had conflicting schedules with the class times.

Chapter 3. Methodology

Methodology

This research includes a mixed-methods approach, combining both quantitative and qualitative data collection techniques and was designed to compare learners' performance with and without AI assistance.

Quantitative research was used to confirm or test hypotheses about perceptions of the use of AI in learning English. In contrast, qualitative research was used to understand students' thoughts and gather information on their experiences regarding language learning strategies, beliefs, familiarity with AI-based technology, and expectations on how such tools can impact and benefit their learning process.

Even though the initial questionnaire and interview prioritise closed-ended questions (quantitative research) to have a wider and more generic view of the findings, qualitative research was also determinant to collect and analyse the linguistic data to understand participants' perspectives on this particular area of study (Alamri, 2019, p. 65).

Researchers are required to interpret responses about behaviour, events, and objects to gain insights into participants' meanings and interpretations (Hennink et al., 2011; Bowling, 2014). In addition, qualitative research is valuable for obtaining open-ended data and assessing thoughts, views, and perspectives (Silverman, 2016). Thus, it allows researchers to collect a broader range of data from diverse populations (Merriam & Tisdell, 2015).

Not only qualitative research but also interviews help conduct studies. Interviews are a common technique used in qualitative research to gather thoughts and perspectives from larger populations (Silverman, 2016; Bryman & Bell, 2015). When the researcher tries to use a flexible approach to understand the interviewee's perspective by interpreting what they say about a particular topic (Kvale, 1996), the interviewer and interviewee can discuss topics in more detail. Kvale also emphasizes that ethical considerations are crucial for ensuring the validity of interview data.

First, an initial questionnaire (Google Forms) was distributed via the Course's group on WhatsApp before the experiment began. It aimed to collect relevant data on students' beliefs about language learning, learning routines and strategies, and level of familiarisation with the flipped classroom model and AI.

The second step of the study involved conducting an experiment to assess the impact of Artificial Intelligence (AI) on language learning, considering its pros and cons in order to enhance the quality of my classes with AI.

The third and last stage of the experiment involved individual interviews that yielded tangible data that enabled me to adjust and optimise the synergy between artificial intelligence tools and the flipped classroom teaching model.

Initially, all learners were asked to complete a task without the aid of AI. Considering the flipped classroom approach, this task served as a starting point to verify their abilities and performance level in language learning without any technological aid. After completing the first task, learners were then given a similar task, but this time with the assistance of AI.

The study primarily aimed to determine whether AI tools or software led to any noticeable improvements in language learning by comparing the participants' performance on these two tasks. If learners performed better on the task with AI assistance and demonstrated an understanding through in-class exercises, it would suggest that AI had a positive impact on their language learning. However, if there was no significant difference in performance between the two tasks, it would indicate that other factors would be at play.

Interviews were conducted to validate and expand on the information gathered from the questionnaires and the controlled experiment. This procedure helped me gain a deeper understanding of the data and ensure its reliability.

The interview encompassed ten closed-ended and two open-ended questions. Through a semi-structured interview, a qualitative research method that relies on asking open questions within a predetermined topic, it was possible to clarify in-depth and better understand the participants' opinions and verify the experiment's effectiveness first-hand. According to Berg (2000), a “case study methods involve systematically gathering enough information about a particular person, social settings, event, or group to permit the researcher to effectively understand how it operates or function” (p. 225).

The researcher can “bring out the best of both paradigms while also compensating for their weaknesses” (Dörnyei & Ushioda, 2011, p. 205) by combining quantitative and qualitative research into a single study. As a result, the qualitative data can be used to supplement and expand on the collected quantitative data.

In short, this study aimed to comprehensively understand how AI tools can influence language learning by combining quantitative data (from the initial questionnaire and data analytics from the interview) with qualitative insights (from the interview and class observation).

Ultimately, this experiment aims to comprehend whether learners' performance varies with the use of AI and whether it significantly and positively impacts students' learning journey, motivation, and results. On top of that, this study also offers a deeper insight into AI's role in language learning.

Chapter 4. Initial Questionnaire Findings

Initial Questionnaire Findings

The introductory questionnaire and the interview were conducted in Portuguese, as the learners in this course are beginners and naturally have a relatively low level of English.

Considering this limitation and the complexity of the questions, I decided to conduct these two parts of the experiment in Portuguese to ensure a better understanding of the questions and allow learners to express their genuine answers based on their opinions and experience.

Due to time constraints, it was necessary to avoid creating a lengthy and time-consuming questionnaire. Thus, data on learners' level of education, previous foreign language learning experience, and nationalities was not included. However, based on enrolment forms and work experience in this school, where I have been teaching English and Portuguese as a foreign language since 2014, I am able to conclude that most of the learners who attend our English courses are from Brazil and Portugal and have completed high school or equivalent. When it comes to Brazilian learners, most of them come with a poor level of English, while those born in Portugal do have some knowledge but need help forming coherent sentences. Most students from Brazil have more difficulties learning English as they are not used to valuing English as much as the Portuguese. English is still the language that breaks barriers today. It is often regarded as a lingua franca, a bridge language that connects people from various countries with different mother languages. It is undeniable that apart from a country's official language, English is the second most important foreign language in the business and academic worlds. It facilitates communication in a globalised world that needs a standard means of communication understood and spoken by most people worldwide, even though some non-native speakers have some trouble using it accurately and naturally. A low grammar level, a limited vocabulary range, and mispronunciation may negatively affect the intended message and lead to misunderstandings.

In the first stage of the experiment, adult learners learning English at the A1 level (beginners) answered an online questionnaire (Google Forms) to gather valuable data on the participants' backgrounds, learning strategies and habits, level of comfort when using technology, familiarity with the flipped classroom approach, and expectations regarding the use of AI in the upcoming classes.

The primary goal of this study was to determine whether AI tools, when combined with the "flipped classroom" approach, can effectively facilitate and accelerate the learning process of a foreign language, specifically English.

The initial questionnaire investigated the beliefs, experiences, and expectations of A1-level Portuguese speakers towards English language learning. Its focus lies on the benefits and drawbacks of AI-powered tools in their learning process. This questionnaire delves into several key areas, including learner demographics (age), motivations for learning English, and existing language learning strategies. Additionally, it investigates participants' views on the flipped classroom model and their comfort level with technology. Furthermore, the questionnaire measures participants' curiosity, expectations for personalised learning, and preferences regarding AI-powered tools. Combining the Likert scale and multiple-choice questions makes the research more relevant and trustworthy as it gathers quantitative and qualitative data. Ultimately, the findings will contribute to developing practical AI-powered language learning tools and strategies to address the needs of A1-level English learners and other more advanced levels with the necessary adjustments.

A Google form was created to collect data on the impact of Artificial Intelligence (AI) on adult English language learning. The form gathered information on participants' beliefs, learning strategies, and opinions on the flipped classroom approach and the integration of AI into that learning model. Thus, to make the data collected as simple and direct as possible, the form was divided into a total of four sections:

Section 1: Beliefs, background and expectations

Section 2: Learning strategies

Section 3: The flipped classroom model

Section 4: AI and the Flipped Classroom Approach – Conclusion

In the very first section, "Beliefs, background and expectations", five multiple-choice questions about the learner's age range, primary reason(s) for learning English, current foreign language learning experience, attitude towards the significant role of AI in language acquisition, and familiarity with AI-powered language learning tools helped me kickstart the study and gain a clearer perspective on my students' starting point before moving into more specific questions.

Initial Questionnaire Findings

In the second section, called "Learning Strategies", there are two questions in which students can choose several options and three multiple-choice questions in which students can only choose one. This section includes questions to unveil the learning strategies that students typically use to learn or enhance their English, study routines, the importance of personalised feedback in their learning journey, the most significant challenges adult learners encounter when learning English and how comfortable they feel using technology for learning purposes.

The questions in the third section are focused on the flipped classroom model. This set of questions includes two multiple-choice questions and three standard multiple-choice questions. The chosen questions in this section were carefully thought out to help me gain a clearer picture of my students' capacity to understand the purpose of the flipped classroom model, assess if they consider it effective, determine how comfortable they are studying by themselves, gauge their awareness of the long-term benefits of the flipped classroom approach and ensure their concerns are not disregarded.

In the final section of the initial questionnaire, there are four standard multiple-choice questions, where students can only choose one of the options given. Additionally, two questions require choosing from a wider variety of possibilities to enrich the conclusions yet to be drawn. The questions in this section are centred around their curiosity on how AI tools can be used in their learning journey, the significance of more personalised and adapted content to fit their needs and goals, their belief in whether AI-powered tools can offer effective feedback on their language learning tasks, the ways AI can be used to enhance their language learning, which language skill or skills they think AI could help them improve the most, and their assumptions on how helpful AI-tools can be for practising speaking a language.

In short, the primary goal of this study is to determine whether AI tools, when combined with the flipped classroom model, can effectively facilitate and accelerate the learning of English or any other foreign languages.

After creating the questionnaire, it was fundamental to take action, inform students of the study's pertinence, and obtain permission to conduct it the following week. Some students were initially unsure about the effectiveness of the upcoming classes because they were unfamiliar with artificial intelligence. However, before the experiment began, they used ChatGPT, an artificial intelligence chatbot, on their phones to improve their speaking

skills, and Gemini, another chatbot, to receive immediate feedback on the quality of their written English. They used Gemini to correct their sentences and seek clarification on grammar topics or word choice. I always double-checked their work and discussed their difficulties after doing activities with or without AI in the classroom or at home.

Then and now, raising students' awareness of not over-relying on AI is essential. AI tools are intended to help learners obtain immediate feedback and clarifications when needed, not replace their dedication, effort and creativity. While technology is valuable, real knowledge often requires deeper engagement without constant reliance on technology. In other words, true knowledge is easily perceived when people are deprived of any technology. Hence, guiding students on using technology and developing the right mindset are essential aspects that every teacher must address in class and should never be put on the back burner.

Section 1: Beliefs, background and expectations

1. What is your age range?

Most participants in this study are in their twenties and thirties. 20% of the students in this group are between 35 and 40, 10% are between 45 and 54 and 10% are over 50, which shows that most students are adults under the age of 44.

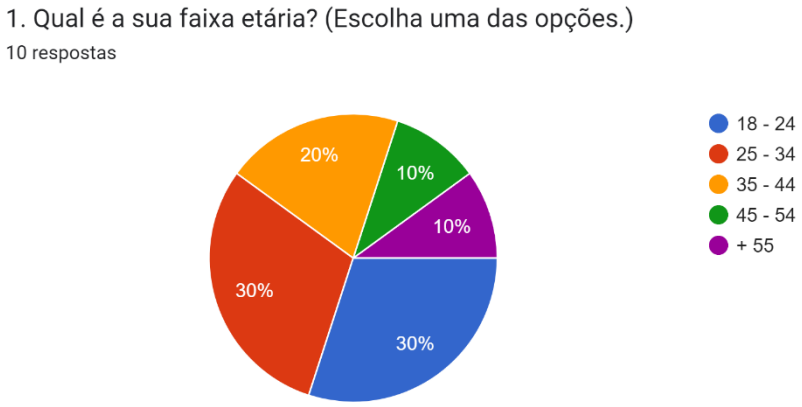

Figure: 4. 1: Age range

2. What is/are your primary reason(s) for learning English?

The horizontal bar chart indicates that the main reasons for participants to enrol in this English course for beginners were work purposes and personal development. Only one out of the ten students in the group had a different reason for learning English. This question aimed to understand the motivations behind their decision to attend the course.

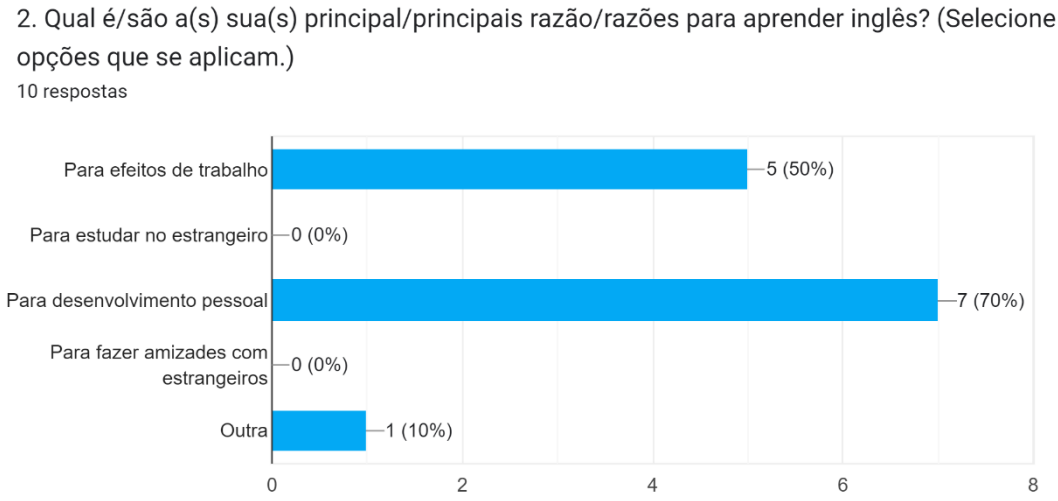

Figure: 4. 2: Primary reason(s) for learning English

3. How would you describe your current foreign language learning experience?

The following pie chart shows that the majority of students, 80%, found the learning experience to be effective and enjoyable, while the remaining 20% viewed it as moderately challenging but rewarding.

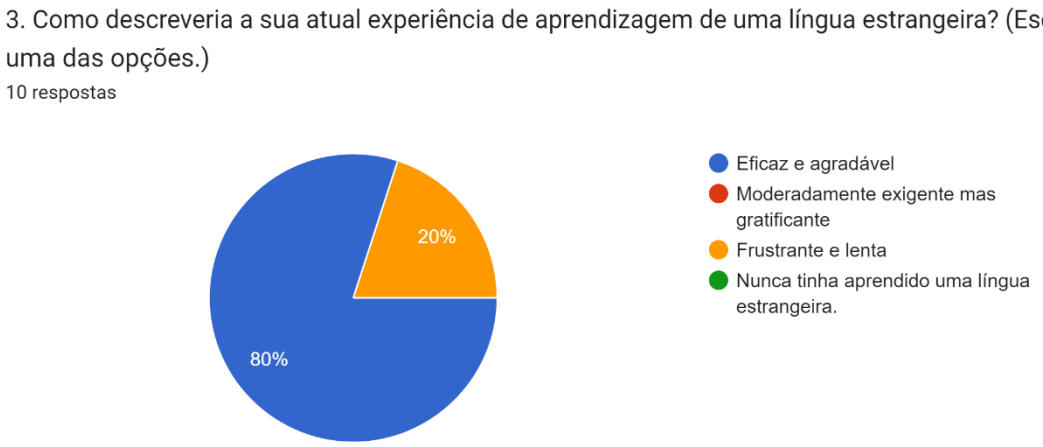

Figure: 4. 3: Current foreign language learning experience

4. Technology plays a significant role in language acquisition. To what extent do you agree with the previous statement?

When asked whether technology played a significant role in language acquisition, 60% of the participants strongly agreed, while 40% just agreed in this study.

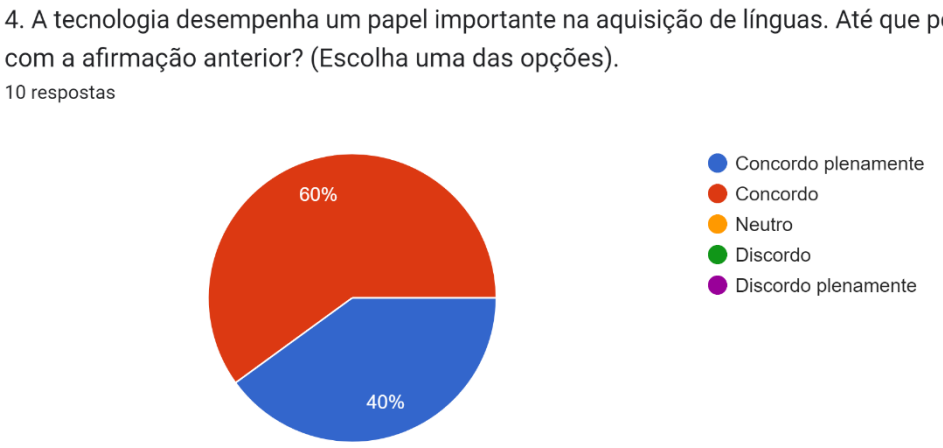

Figure: 4. 4: The role of technology in language learning

Initial Questionnaire Findings

5. Have you ever used any AI-powered language learning tools before?

Before the course, 40% of the participants claimed to have used AI-powered language learning tools, while 60% indicated they had not used such tools.

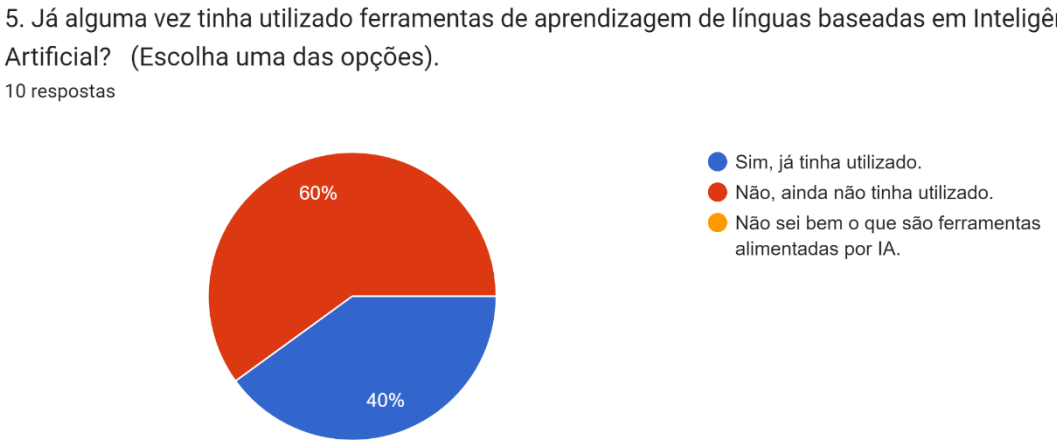

Figure: 4. 5: Prior experience with AI tools

Section 2: Learning strategies

1. Which of the following learning strategies do you typically use to learn or improve your English?

Using language learning apps and watching films, series, TV shows, or YouTube videos in English are among the students' favourite strategies for learning or improving their English. That is followed by activities like listening to English music and practising grammar and vocabulary through workbooks. Others prefer talking with native speakers whenever possible. Few participants regularly read books, articles or the news in English. None of the students use flashcards to work on their English. One of the participants has a different strategy for learning or improving English.

Based on the results concerning this group of students, language learning apps and exposure to English through visual media such as films, series or YouTube videos are popular strategies for improving their English proficiency. On the flip side, it is notable that reading English books, articles, or news is not common among these students, and using flashcards is not appealing enough. These findings highlight the preference for audiovisual learning over more traditional methods.

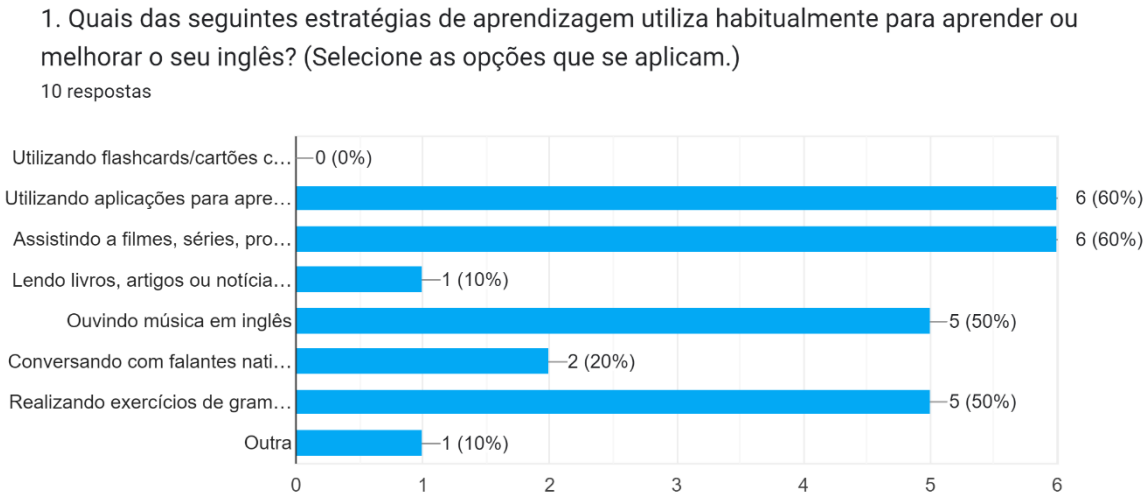

Figure: 4. 6: Learning strategies to learn or improve one's English

2. How often do you usually study English (beyond the classroom setting)?

When it comes to study habits, it is unsurprising that most participants do not allocate the ideal time for improving their English, which would be daily or three to four times a week. Many adult learners fail to reach a higher level of English because they do not dedicate themselves to learning English beyond the classroom setting, preventing them from reaching a proficiency level of B2 or higher.

The pie chart shows that 20% of the participants study English autonomously three to four times a week, while another 20% do so twice and 20% once weekly. Unsurprisingly, some students never study at home despite recommendations. Additionally, 10% of students study every other day. Only one student in a group of ten appears to be highly dedicated to obtaining good results in his/her learning journey.

Consistency is undeniably a key factor in achieving success in learning English and other skills. The lack of regular practice and effective learning strategies can contribute to poor results, leading to demotivation and, ultimately, quitting learning English.

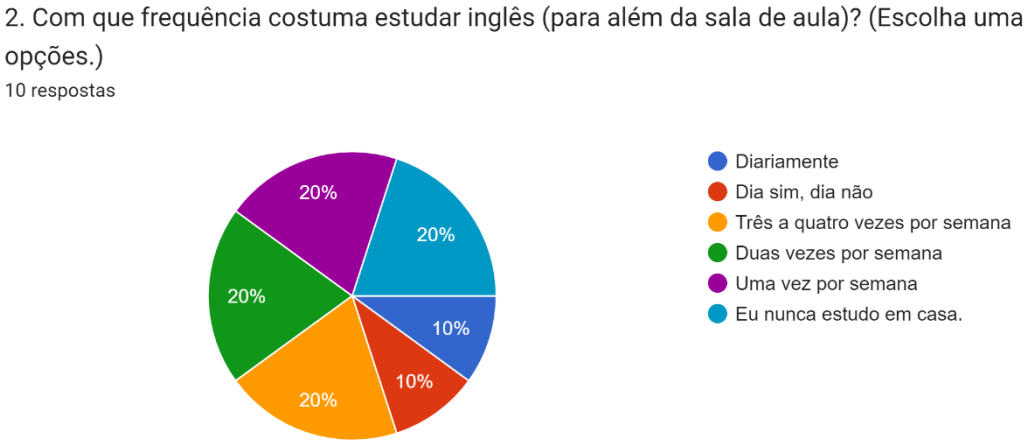

Figure: 4. 7: Studying English beyond the classroom setting

3. How important is personalised feedback in learning English?

In terms of personalised feedback, 60% of the students in this group consider it very important and 40% important. Based on my experience, it is crystal clear that personalised feedback plays a crucial role in the learning process, especially when learners are taking their first steps towards fluency.

The four pillars of a successful and enduring learning journey are motivation, positive reinforcement, regular and individual feedback, and plenty of opportunities to practise real-life English in the classroom and beyond.

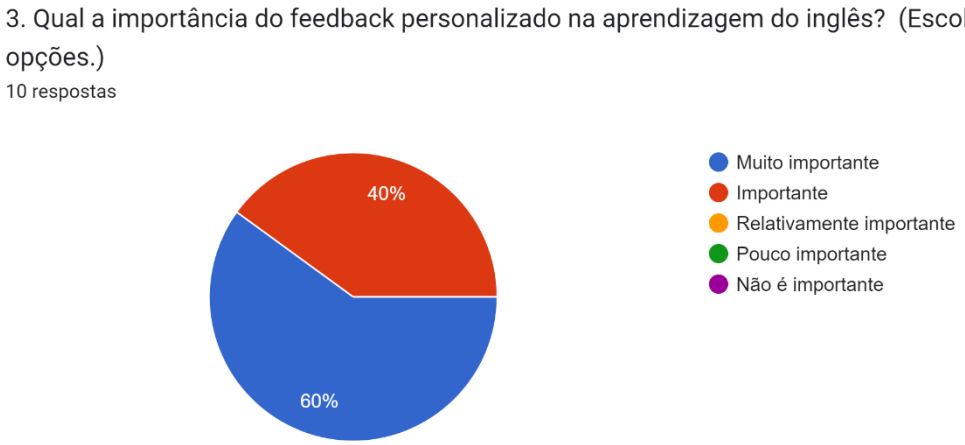

Figure: 4. 8: The importance of personalised feedback

4. In your opinion, what are the biggest challenges adult learners face when learning English?

When asked about the most significant challenges adult learners face when learning English, six out of ten students felt discouraged by their mistakes, five recognized that lack of consistency harmed their learning, and four struggled with grammar rules.

Three students stated they had little time to study English outside of class, while two admitted needing a straightforward study method or objectives. Only one student out of ten believed limited access to native speakers hindered the learning progress.

In fact, many students still neglect the importance of studying at home in their free time, believing that classes alone are sufficient for achieving fluency in a foreign language. Consistency and lack of discipline have always been their major weaknesses.

All students have access to a learning platform, a weekly study plan outlining activities from Monday to Saturday, and continuous support. However, only some consistently take advantage of all the available resources. Keeping students on the right track is essential as initial motivation for learning English wears out quickly. Additionally, their resilience is easily shaken when they face difficulties, mainly due to a lack of autonomous work and failure to follow course instructions for daily assignments, even when feeling demotivated or tired.

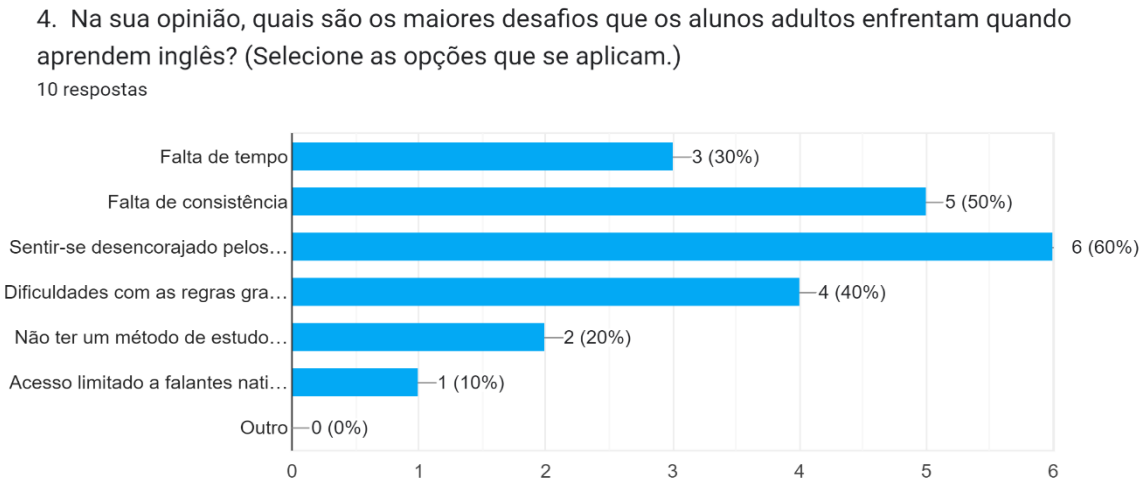

Figure: 4. 9: The biggest challenges adult learners when learning English

5. How comfortable do you feel using technology for learning purposes?

In this study, 50% of the participants felt comfortable using technology for learning purposes, while 40% felt very comfortable. 10% of the students were relatively comfortable with technology. Therefore, it is essential to continuously explain to students how to use all the equipment and software provided. A comprehensive, visually appealing, hands-on booklet containing all the steps to using all the tools used in the course is fundamental to ensure they do not feel overwhelmed. In the very first class, I provided details about the course programme, procedures to ensure continuous and visible progress, the learning approach adopted (the flipped classroom model), and the requirements for passing the A1 level.

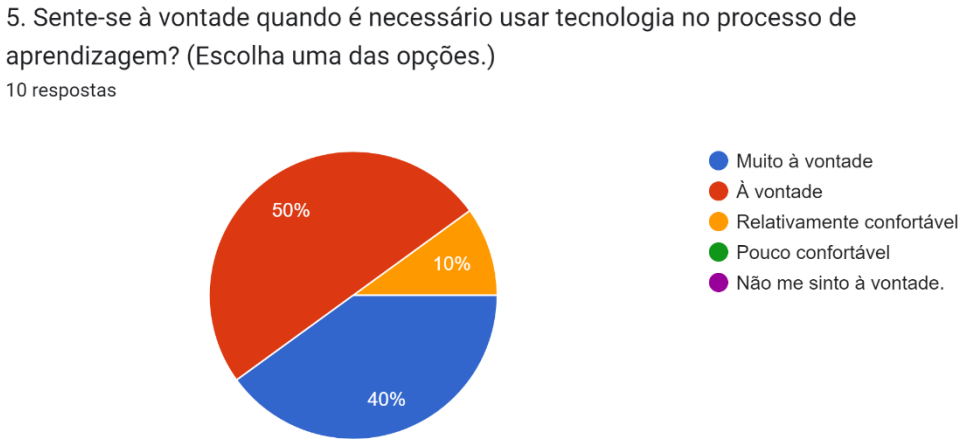

Figure: 4. 10: The level of comfort when using technology

Section 3: Flipped classroom model

1. Are you familiar with the flipped classroom approach in language learning?

The vast majority of the students in this group (80%) were familiar with the flipped classroom model, as an explanation is given at the beginning of each course to help them understand its benefits and why it is crucial to follow all instructions and request assistance whenever needed. Believing that progress can be achieved without continuous effort and practice is a delusion.

10% of the students did not know what the flipped classroom model entailed, and another 10% were unsure. Since some students joined the course later or missed classes, especially the first one, this is a possible explanation for not knowing the purpose and advantages of the flipped classroom model. Thanks to this learning approach, students can prepare for the following class, which serves as a prelude to what will be discussed. Guided autonomous work is undeniably a great way to enhance learning progress.

The flipped classroom model helps students develop essential skills, such as problem-solving, critical thinking, and independent learning.

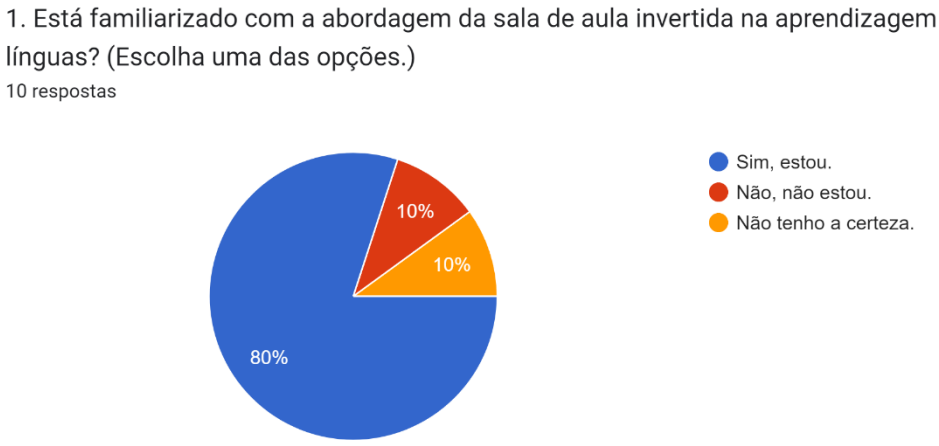

Figure: 4. 11: Familiarity with the flipped classroom approach

2. How effective is the flipped classroom approach (which involves pre-class learning and in-class practice)?

Regarding the efficiency of the flipped classroom approach, which involves pre-class learning and in-class practice, 70% of students regarded it as very effective and 30% considered it effective.

This pie chart demonstrates a strong preference for combining pre-class learning and in-class practice, as its overwhelmingly positive feedback suggests that most students in this course had well-received the flipped classroom model.

These findings emphasise the need to further explore and integrate the flipped classroom approach in educational settings. As the pie chart shows, the flipped classroom model is perceived as a beneficial element in the student's learning progress. It also gives students more opportunities to engage with the materials and peers and practise their knowledge more frequently.

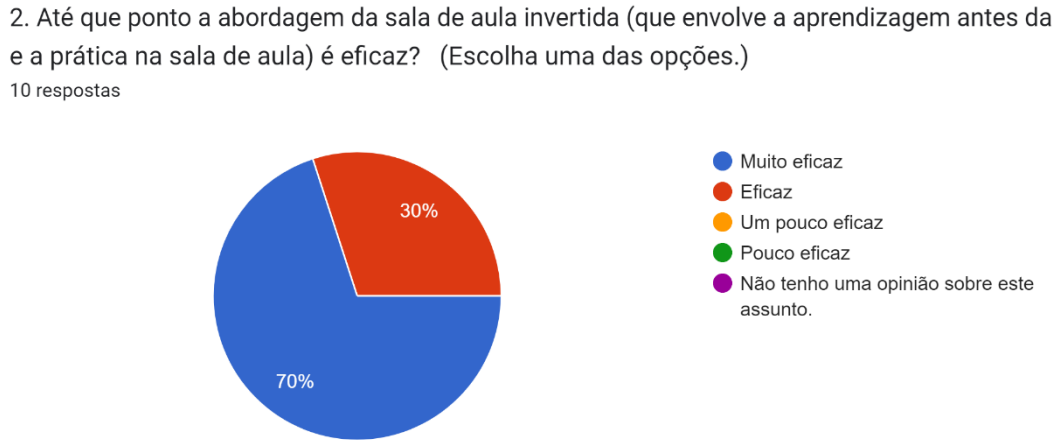

Figure: 4. 12: Effectiveness of the flipped classroom approach

3. How comfortable are you with independently acquiring knowledge before attending the next class?

In this experiment, 40% of the participants were comfortable acquiring knowledge independently before attending the following class. Only 20% felt very comfortable with autonomous learning, indicating the need to allocate more time to providing strategies and tools to assist learners in the future when they are not in the classroom setting. Additionally, 10% were slightly comfortable, 20% were a little uncomfortable, and 10% were totally uncomfortable.

Given that guidelines for autonomous studying are provided in the first classes and when requested, it is evident that more frequent reinforcement of good study practices is necessary throughout the courses to optimise students' performance and teachers' awareness of teaching strategies that fail to address students' weaknesses.

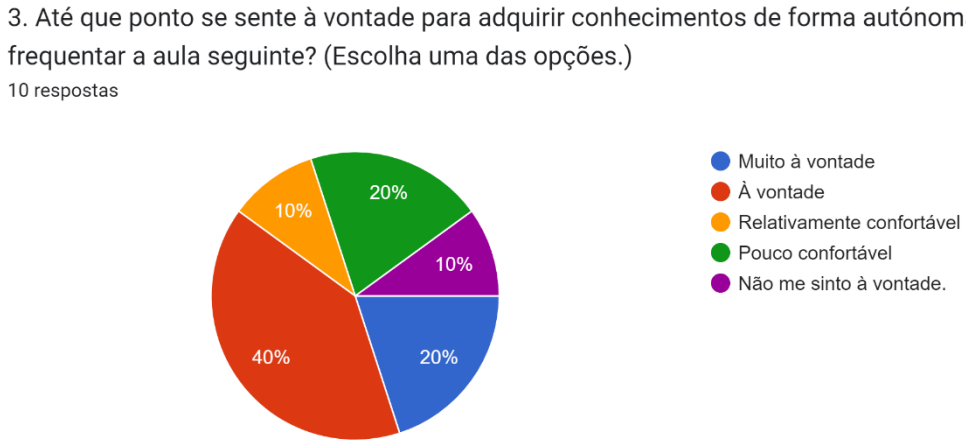

Figure: 4. 13: Studying independently before attending the next class

4. In your opinion, what are the main benefits of the flipped classroom approach?

When asked about the main benefits of the flipped classroom approach, six students out of ten believed it could improve in-class participation. The horizontal bar chart also shows that five students thought the flipped classroom approach could contribute to a deeper understanding of the topics, while four assumed this approach would help them obtain faster results. Three students felt that it could increase their autonomy. Only two students believe this learning approach would provide more time for practising speaking skills.

Based on these results, most students see benefits in the flipped classroom approach, including more opportunities to participate in class, a more profound understanding of topics and increased autonomy.

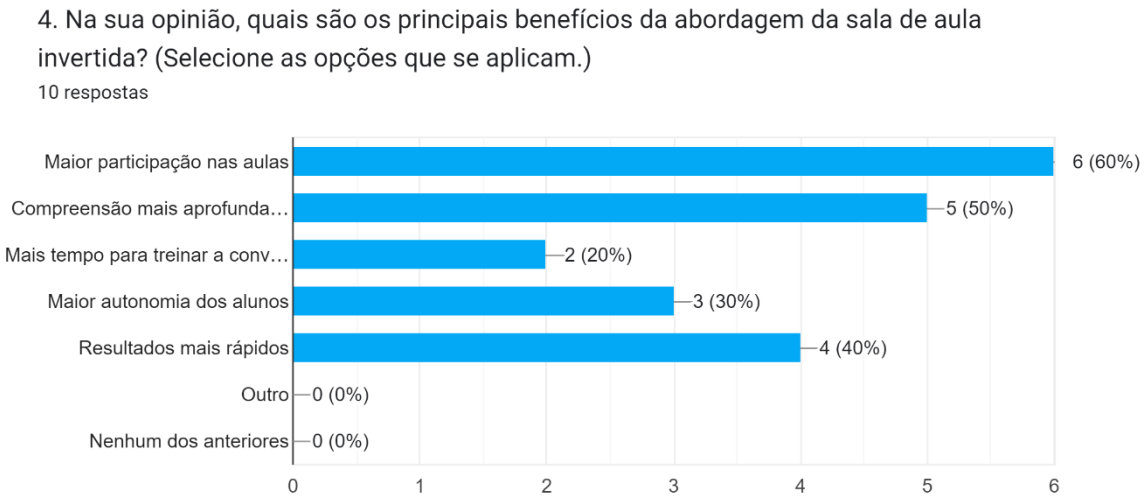

Figure: 4. 14: The main benefits of the flipped classroom approach

5. What are your concerns, if any, about the flipped classroom approach?

Four students in this group were concerned about the lack of motivation to complete pre-class work. Two were worried about possible difficulties understanding pre-class materials, and one was afraid of feeling unprepared for in-class discussions. This question revealed some factors that concerned this group but failed to have a broader overview of the students' concerns regarding the flipped classroom approach, as four participants chose the option "none of the above". Despite knowing some of the potential disadvantages that do not overshadow all the advantages of this approach, it is essential to admit that this question, in particular, should allow participants to develop their answer by including one open-ended question such as "Do you have any other concerns? What are they?" By adding that question, a better conclusion for this study would be achieved.

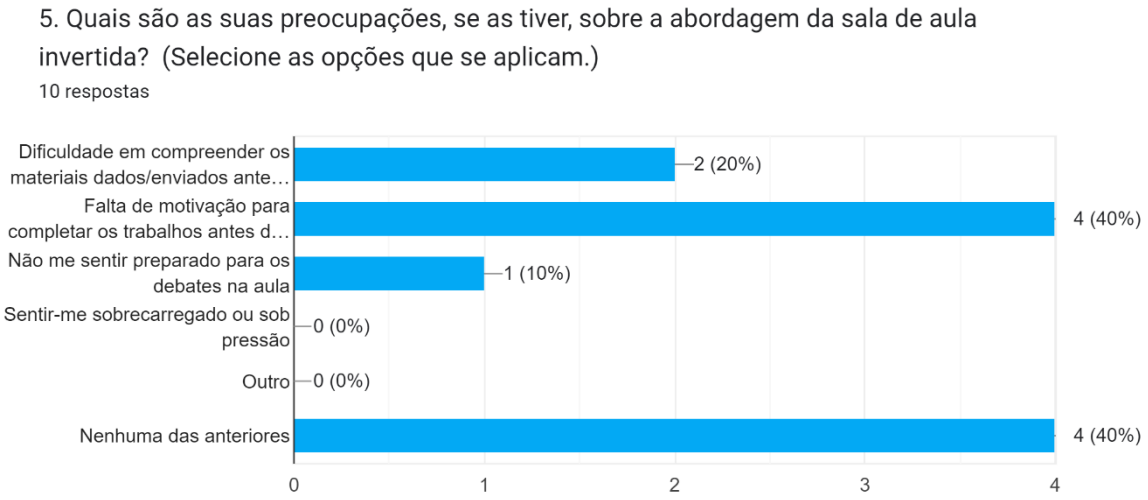

Figure: 4. 15: Concerns regarding the flipped classroom approach

Section 4: AI and the Flipped Classroom Approach – Conclusion

1. How curious are you about how AI tools can be used in language learning?

In terms of curiosity about how AI tools can be implemented in language learning, 40% of the participants were very curious, and 20% were curious. In opposition, 30% were somewhat curious, and 10% were slightly curious.

All in all, the results demonstrate a significant level of interest in implementing AI tools in language learning, with most participants expressing a high or moderate level of curiosity.

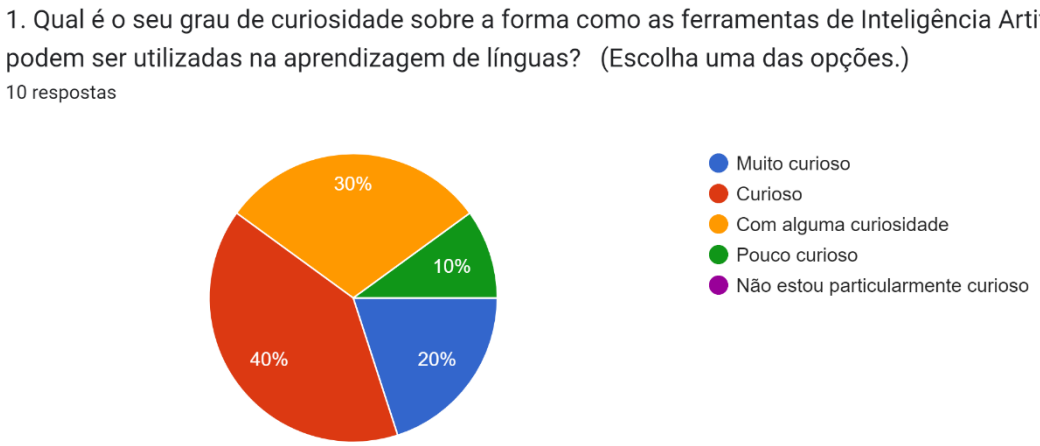

Figure: 4. 16: Level of curiosity on using AI in language learning

2. How important is it to you that your language learning experience is tailored to your individual needs and goals?

Concerning the importance of a language learning experience tailored to individual needs and goals, 60% of the participants considered that feature important, compared to 40% who saw it as very important.

In conclusion, the data highlights that most students in the experiment value the tailored language learning experiences adapted to their needs and goals. These results denote a strong demand for personalised learning approaches within the language sphere.

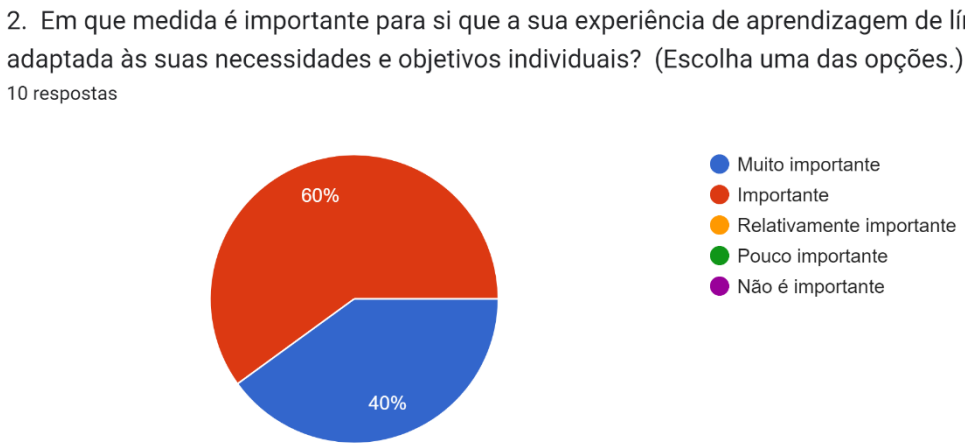

Figure: 4. 17: The importance of personalised learning

3. Do you believe AI-powered tools can provide effective feedback on language learning tasks?

At this early stage of the experiment, students claimed that AI-powered tools can provide effective feedback on language learning tasks.

These students believe that AI-powered tools can offer prompt and personalised responses to their tasks. This personalised feedback may contribute to their ongoing motivation, helps them keep track of their progress, and allows them to have their questions answered in a matter of seconds whenever needed. For example, receiving instant feedback on vocabulary usage or proper use of tenses can motivate students and help them measure their progress more effectively.

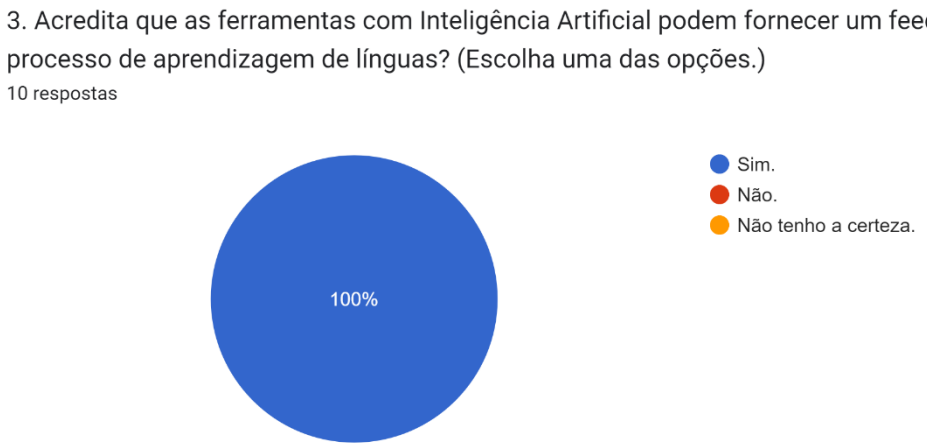

Figure: 4. 18: AI and its feedback on the learning process

4. Which of the following do you think are the most effective ways to use AI in language learning?

Creating interactive simulations and virtual reality environments and facilitating conversation practice with virtual tutors were among the participants' favourite ways to enhance their learning experience, with six votes for both options. This option was followed by creating personalised exercises and quizzes based on the learner's needs and goals, selected by five out of ten students. There is also a strong preference between providing personalised feedback on grammar and vocabulary exercises and adapting learning materials based on the student's progress, both receiving four votes. Only two students within the group chose automatically marking written assignments and suggesting improvements as the most effective ways to use AI in the learning process.

Before the experiment, AI tools were gradually introduced, and an explanation of their use, benefits, and drawbacks was also provided to the students.

At first, some students were unfamiliar with AI-powered tools in language teaching, and that is why it was fundamental to teach those with greater difficulties to operate them with ease and cope with initial frustration due to inexperience in dealing with AI or poor information and communication technology (ICT) skills.

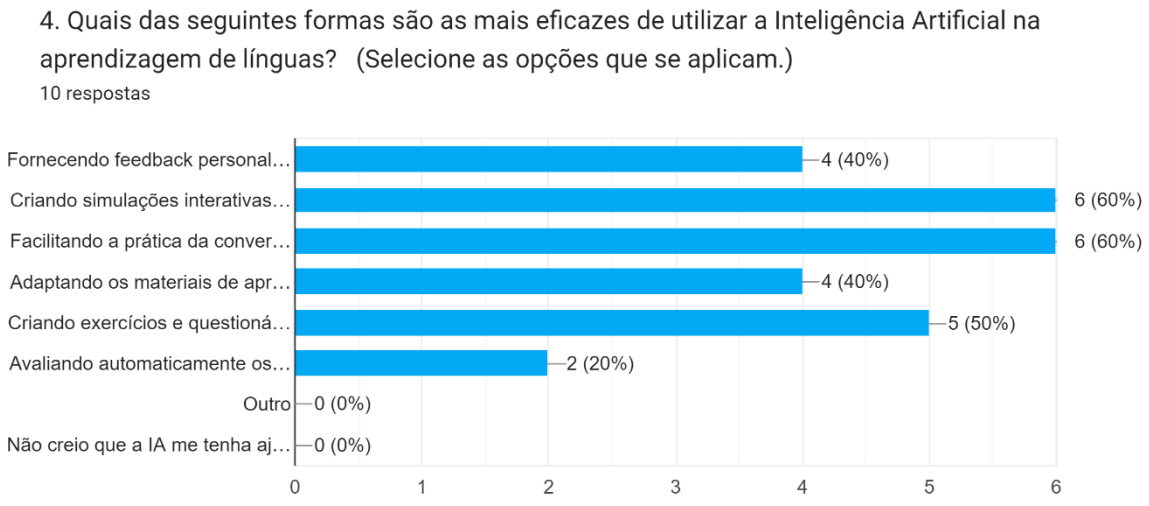

Figure: 4. 19: The most effective ways to use AI in language learning

5. Learning a new language involves many skills. Which ones would you prefer an AI tool to help you improve the most?

Participants in the study preferred AI tools to help them improve their speaking fluency (ability to speak more confidently and naturally) and writing accuracy (grammar and vocabulary usage), with five votes each.

Students also sought help to ameliorate their listening comprehension skills (understanding spoken language) and pronunciation (sounding like a native speaker), with four votes each.

Notably, four of the ten participants wanted to improve the four pillars of a language: reading, writing, listening, and speaking. Only three students aimed to develop reading comprehension skills (understanding written text).

At this early stage of the experiment, none of the students mistrusted AI, a positive indicator of the group's favourable views regarding the power of AI in refining their language skills. In fact, most teachers are fully aware of how challenging teaching can be when students are sceptical or doubtful about the effectiveness of learning strategies or tools.

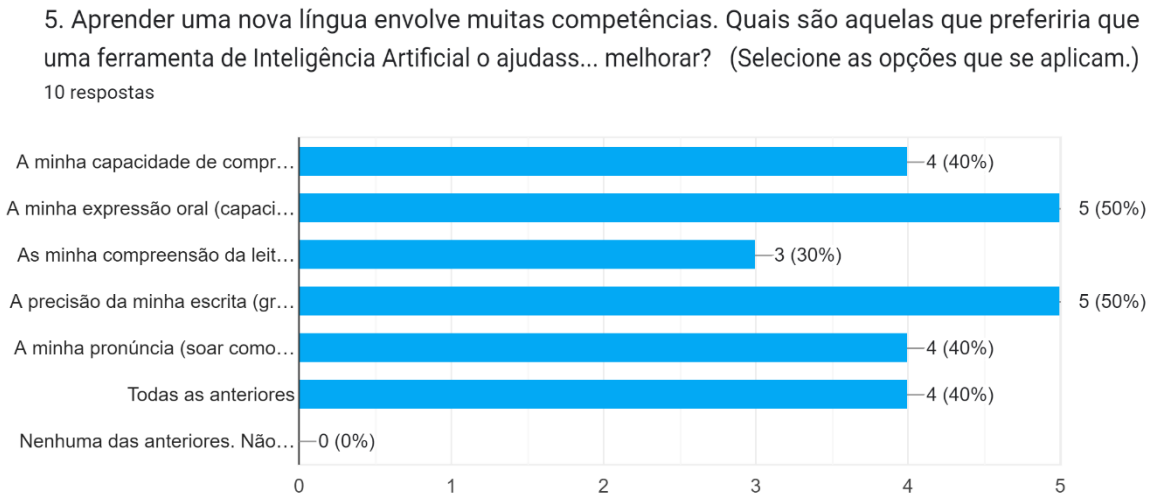

Figure: 4. 20: Which skill would students like AI to help them with?

6. Some believe that AI tools can be helpful for practising speaking a language. How helpful do you think AI can be?

In this initial phase of the experiment, 50% of the participants perceived AI tools as helpful for practising speaking a language, and 40% regarded them as handy. Conversely, only 10% of the students were not wholly convinced that AI tools could enhance their speaking.

This study also showed that none of the students held a neutral position, indicating that most students firmly held a positive attitude towards using AI-powered tools to put their speaking ability to the test. The fact that 90% of the students see AI tools as helpful suggests a green light for integrating AI-powered tools in the following classes.

Figure: 4. 21: How helpful AI can be in language learning

Based on the data provided in the questionnaire, most participants, who were under 44, intended to learn English for work purposes and personal development. In this first stage of the experiment, the participants described their learning experience as effective and enjoyable, with technology playing a significant role in their language acquisition. It is worth noting that 60% of students had never used AI-powered language learning tools before the course.

When it comes to learning strategies, using language learning apps and exposure to English through visual media such as films, series, or YouTube videos are the most popular methods for these students. Unfortunately, most students do not allocate enough time for

autonomous study at home, with only a tiny percentage studying every day or multiple times a week.

Despite recognising their biggest challenges when learning English, the lack of consistency and discouragement from mistakes stand out. Additionally, most students acknowledge the importance of personalised feedback when learning English, which contributes to faster and more effective learning.

The flipped classroom approach was well-received by most students, with the majority finding it effective. However, some concerns arose, including low motivation to complete pre-class work and difficulties understanding pre-class materials.

Regarding AI and the flipped classroom approach, there is a high level of curiosity about how AI tools can be used in language learning. In other words, participants value tailored language learning experiences and believe in the effectiveness and practicality of AI-powered tools in providing feedback on their learning tasks.

Creating interactive simulations and virtual reality environments, facilitating conversation practice, and providing personalised exercises and quizzes are among the students' favourite strategies to help them learn English.

In essence, the data suggests a strong interest and belief in the potential of AI-powered tools to enhance language learning, with participants generally showing openness and a positive attitude to leveraging these technologies to improve their language skills.

Chapter 5. The Experiment

1. Listening

Goal(s) of the experiment

This experiment aimed to analyse the impact of using Artificial Intelligence (AI) tools in listening activities for A1 English learners and verify whether their use contributes to a better understanding of spoken English. Two listening activities, including a free AI tool and a more traditional approach, were employed to evaluate the students' listening skills.

In essence, the experiment assessed whether AI tools could be more effective at helping A1 English adult learners understand spoken English more rapidly and easily. It compared an AI-assisted listening activity with a conventional one to evaluate each method's potential advantages and disadvantages.

1.1. Activity without AI

a) Materials and tools

Table: 5. 1: Listening activity without AI

Skill	Main Topic	Materials	Tools
Listening (without AI)	Daily routines	Videos * Web pages * Personalised flashcards	YouTube YouGlish TTSMaker Internet
Reference(s) *	1. Woodward English. (2023, June 21). *Learn English Vocabulary - Daily Routines in English for Adults* [video]. YouTube. https://www.youtube.com/watch?v=hzzc1VSwuIg 2. Animated English. (2017, December 14). *Animated English - My Daily Routine* [video]. YouTube. https://www.youtube.com/watch?v=CN19WrsJkGw 3. ESLvideo.com. (2024). *My Daily Routine – English for Beginners A1-A2* [Quiz]. Retrieved from https://eslvideo.com/quiz.php?id=43183 4. YouGlish for English. (n.d.). https://youglish.com/ 5. TTSMaker. (n.d.). https://ttsmaker.com/		

b) Procedure

Before the class

Before the listening activity, students watched two short videos about daily routines to become more familiar with English and expand their inner vocabulary banks. While watching the videos, they were instructed to think about their own daily routines and encouraged to take notes and write down vocabulary or some example sentences from the videos. This preparation task helped them get comfortable using English to describe their daily activities.

In the classroom: listening activity about a daily routine

The main objective of this task was to understand a simple text about a daily routine.

After presenting flashcards related to a young woman's daily routine video containing vocabulary and grammar structures, it was time to explain the grammar structures within the text (word order, adverbs of frequency and when to use the present simple tense). Subsequently, I read out words, phrases, and sentences to demonstrate proper pronunciation and emphasised the importance of connected speech to understand spoken language better.

Next, I read five sentences aloud from the video to assess my students' comprehension and asked a few questions related to those sentences. Initially, I did not provide any options, but if the students appeared confused or did not answer, I provided three alternatives. In addition, I explained and demonstrated how students could reduce the playback speed (the speed at which a video is played) and read the subtitles when they are available when watching videos on YouTube.

To complement that explanation, I quickly introduced students to YouGlish and explained how they could use the tool to search for words and phrases in context and adjust the speech pace. Then, I opened a new tab in the same browser window to demonstrate how they could benefit from TTSMaker, a free text-to-speech tool and text reader that converts text to speech. On this website, users can either copy texts from the internet or write original ones and bring them to life. It also offers options to alter voice speed, pitch, and choose between male and female voices.

Students were asked to take notes and encouraged to try both tools at home and jot down their difficulties and questions.

Then, students listened to a short audio file detailing Marianna's daily routine twice. Once the activity was completed, a link was provided to assess their understanding through multiple-choice and gap-filling exercises. After that, students had the opportunity to verify the correct answers for the online exercises and inquired if they had any questions about the tasks.

To conclude, students wrote five sentences about their daily routines and read them to the class. This final activity ensured their grasp of the taught material and allowed me to double-check if learners comprehended each other while speaking. After each presentation, I corrected the students' most prominent grammar and pronunciation errors in a positive, supportive, and friendly manner.

c) Findings after the experiment

The combination of flashcards, videos, and interactive activities was a great way to engage students and help them acquire or revisit the content.

The main goal of the listening activity without AI was to test and hone students' listening skills, which was accomplished. Thus, this activity allowed students to understand and produce language by exploring and applying vocabulary, grammar structures, pronunciation, and listening comprehension exercises.

After explaining, demonstrating, applying, and presenting the new content, students felt more confident and motivated to speak in public, and they left the classroom with an apparent sense of realisation.

In short, the focus on active participation and student-centred learning was effective and validated by their engagement, results and feedback at the end of the class.

d) Relevance of the findings

After the activity, it was clear that providing a clear explanation of the lesson's purpose and demonstrating the lesson's key points, followed by activities to assess students' ability to understand spoken English and giving them time for creative work (writing five sentences about their daily routines), were effective in engaging students. Throughout the

activities, they were visibly enthusiastic and willing to learn. Teachers must ensure students understand the lesson's goal and know the activities' steps and nature. When students grasp the concept of activities, they are more likely to participate, work harder, and be more proactive, fostering a stronger connection between the teacher and them.

Proper instructions and enough time to let students express their questions and concerns before starting independent or group work make students more likely to participate in the activities and usually feel more motivated with a sense of realisation at the end of the class. It is vital to ensure that students use and understand the new or previous knowledge in context while teachers minimise assistance as they move forward.

The expository prelude and in-class demonstration, combined with the practical component, helped students understand the concepts and gain more confidence in performing the given tasks in class.

When students roll up their sleeves and have the opportunities to seek and apply knowledge, classes are more engaging and productive, and that is one of the reasons why the task-based approach is one of my favourite teaching approaches.

Task-based instruction (TBI) is an approach to language teaching that focuses on using tasks or real-life situations to teach language skills. It has gained popularity in recent years as a practical language teaching method.

One of the main advantages of TBI is its adaptability, providing students with opportunities to use the language in a meaningful context. By using real-life situations or tasks, students are able to practise their language skills authentically. This approach makes learning more engaging and motivating for students, as they can see the practical value of what they are learning and are very likely to apply it in their lives.

Another advantage of TBI is that it allows for the integration of different language skills, such as listening, writing, reading and speaking. In this listening activity, students had to talk about their routines. Before presenting their routines in front of their peers, they did listening exercises and wrote sentences about their routines, which required reading, too. This sequence provided students with a more holistic approach to language learning, as they could see the connections between different language skills.

Overall, TBI is an outstanding approach to language teaching since it allows students to use language in various and meaningful contexts. Thanks to TBI, it is possible to integrate different language skills, promote greater learner autonomy, and boost student motivation.

One aspect to consider after the experiment is the need to promote and help students understand the relevance of following the study plans available in their learning platform. Those study plans contain activities to reinforce and expand learners' ability to listen, read, write and speak in English. It is sometimes an ungrateful and gruelling task to teach students who are committed and those who do not value and underestimate the early recommendations and the course instructions that were designed to help students achieve gradual and visible results. Despite my efforts and constant warnings, numerous students still do not listen and practise their listening skills outside the classroom setting, which delays their learning. This daunts me as I am fully aware that those who are indolent and absent-minded are very likely to abandon their English learning project as soon as their motivation wears out and the language becomes more complex and challenging.

The ability to understand spoken English at this early stage of learning is the most demanding one for teachers since students need to allocate time for listening before attempting to speak it. Most Brazilian students who join my classes to start learning English have no basis in English and are not used to listening to various English accents, especially the British one that most consider imperceptible initially. Their minds are like blank slates that need vigorous and considerable drilling, that is, revisiting knowledge acquired in class through repetition. Mastering new skills requires intentional, meaningful, and consistent repetition to the point that it is natural and spontaneous and becomes second nature. Drilling has been an integral component of the audio-lingual approach in language courses for many years. While drilling was once a popular method for teaching foreign languages, its effectiveness is now understood to be limited and ineffective without adding context and purpose. Nevertheless, it can still be a valid tool for helping learners master language mechanics, such as pronunciation and grammar. By practising language patterns repeatedly, learners can become more confident and fluent in their speech as they recognise and are familiar with those patterns.

The drilling technique, when applied in context (learning chunks of language such as common phrases and collocations) and accompanied by other memorisation techniques, such as flashcards, spaced repetition and mind maps, plays a pivotal role in acquiring a new language. Developing and refining students' listening skills is nearly impossible if they refuse or simply discard their responsibility in autonomous, consistent work to succeed long-

term in their learning journey. It is a teacher's duty to implement, supervise and give feedback on the student's progress, as several distractions and threats typically affect learners, leading to abandoning the fluency goal. When teaching a language, teachers need to warn language learners that dreams and goals operate differently, as the latter demands consistency, determination, resilience and independent studying. Successful learning goes beyond the classroom setting and requires creativity, problem-solving and critical thinking abilities.

Instructing language learners to do online exercises suited to their fluency level or showing them that there are creative ways to incorporate audio files in English into their daily is feasible. They can listen to podcasts or audiobooks while doing household chores or jogging. Most teachers are still too concerned with teaching the language itself and neglect the importance of Neuro-linguistic Programming (NLP) in their teaching practice. Learning is linked to emotions; if humans are emotional creatures, it makes perfect sense to consider this valuable strategy.

According to Bandler and Grinder (1979), NLP is a method for understanding and replicating human communication. This "modelling" process was designed to examine and identify high achievers' unique techniques and strategies and teach them to others (Tosey & Mathison 2008).

Bandler and Grinder (1979) sought to understand not only what effective individuals do to perform above the average but also how they do it (Churches & Terry, 2007). The ultimate goal of NLP in education is to offer a framework compatible with empirical learning and teaching and to increase learning effectiveness and efficiency.

In essence, developing listening and other skills requires finding and using materials tailored to our students' level of proficiency, age and needs, using effective learning strategies (e.g., spaced repetition), and applying NLP principles to make the learning process more engaging, meaningful and productive (e.g., guiding and helping students manage their emotions and develop functional strategies for revision and prior preparation for classes). Equally important is fostering a friendly, goal-oriented and collaborative environment in class. It is worth remembering that positive results derive from effort, guidance and regular constructive feedback.

Since teaching practices constantly evolve, teachers must keep themselves relevant and updated by seeking new ways to make their classes as memorable and impactful as possible in their students' journey.

In the following class, students used AI tools during listening activities to see if they could improve their results. The goal was to determine how AI tools could impact their learning. As part of this experiment, I conducted two activities: one with AI tools and one without. Throughout the experiment, students learned how to effectively, responsibly, and ethically utilize AI in their learning journeys.

e) Lesson Plan

Table: 5. 2: Listening without AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
0/7	Instructions: Preparation at home (in the previous class)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Students watch two short videos related to daily routines. - Take notes and write down vocabulary from the video.	T —> Ss
1	Warmer (20 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Present personalised flashcards with vocabulary and grammar structures from a video - Read some words, phrases, and sentences related to the text	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Allow students to think about the topic and test their critical thinking and problem-solving abilities - Allow students to develop their ability to connect ideas and draw logical conclusions. - Provide guidance when needed	- Read out five sentences from the video to assess my students' comprehension and ask questions related to each of those sentences - Ask questions related to those five sentences	T —> Ss Ss —> T
3	Supervised and guided practice (20 minutes)	- Check the students' understanding - Observe their ability to connect ideas and draw logical conclusions - Talk about learning tools to improve their listening skills	- Ask questions related to those five sentences - Review the correct answers and discuss any questions that may arise - Explain and demonstrate how students could use YouGlish and TTsmaker	T —> Ss (instructions) Ss —> T T —> Ss (guidance)

	Stage and time	Aim	Procedure	Interaction
4	Practice (performance) (20 minutes)	- Evaluate students' understanding of spoken English - Assess their ability to connect ideas and draw logical conclusions	- Listen to a short audio file twice - Do activities autonomously (multiple-choice and gap-filling exercises)	T —> Ss
5	Teacher's feedback (20 minutes)	- Help students identify and comprehend areas for improvement	- Review the correct answers and ask students if they have any queries about the tasks	T —> Ss Ss —> T
6	Warm down (15 minutes)	- Check students' understanding and ability to use what they have learnt	- Write five sentences about their daily routines and read them to the class	T —> Ss Ss —> T
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Provide instructions to students regarding the next activity	T —> Ss
	120 minutes	End of the lesson		

1.2. Activity with AI

a) Materials and tools

Table: 5. 3: Listening activity with AI

Skill	Main Topic	Materials	Tools
Listening (with AI)	Daily routines	Videos * Website * Personalised flashcards	YouTube JotBot AI Internet
Reference(s) *	1. Elephant English Podcasts. (2023, June 25). *Beginner English listening practice/speaking practice Level 1/A1 - My daily morning routine* [Video]. YouTube. https://www.youtube.com/watch?v=PtikdNLcfes 2. JotBot AI. (n.d.). Retrieved from https://app.myjotbot.com/share?userId=VWZUgUGJgpSpWjX7xQsUO9VUs8k2&documentId=Xgq8TPpXWic3sTSaRUNK		

b) Procedure

In the classroom: listening activity about a daily routine

First, I shared personalised flashcards based on vocabulary and grammar structures related to a girl's daily routine. After presenting the flashcards and explaining the grammar topics, I read words, phrases, and sentences to illustrate proper pronunciation and quickly explained the importance of connected speech for understanding spoken language.

Following that, I read five sentences from the video to evaluate my students' comprehension and asked questions about each sentence. Initially, I refrained from providing options, but I offered three alternatives if the students looked confused or did not respond.

After that, I used an AI-powered website called JotBot AI to help me create activities for my students. Then, students took a multiple-choice quiz and a filling-up-the-gaps activity and reflected on the correct answers. We also used JotBot AI to obtain the correct answers

and asked any other questions students found relevant or interesting to understand the text better.

After the activity, I taught them how to use this AI tool for summarising videos, obtaining transcriptions, asking questions about videos, and create activities to test their understanding.

Ultimately, I emphasised that they should not depend entirely on AI tools but use them to maximise their learning and help them when uncertain or assistance is needed.

JotBot AI's ability to summarise videos, provide transcriptions, and answer questions proved to be valuable for students. However, the AI-assisted approach also had limitations, as it required moderate familiarity with technologies, particularly AI.

c) Findings after the experiment

Both sets of activities were successful. However, the traditional approach that encompassed a pre-listening task, personalised flashcards and teacher-led instruction proved to have more benefits in the classroom setting as some students had some trouble adapting to the software with AI, and due to time constraints, the experience with AI became more challenging than expected. Even though some students understood the purpose of the AI tool called JotBot AI, some students felt overwhelmed by its numerous features.

In this experiment, the AI-powered website, JotBot AI, assisted students in summarising videos, obtaining transcriptions, and answering questions. Undoubtedly, it provided precious additional support. Nonetheless, it is essential to note that while AI tools are beneficial for instant feedback, giving ideas or commenting on one's work, students should be encouraged not to rely solely on them but to use them responsibly to enhance their learning experience.

Even though Jobot AI's quality is good, teachers must be aware that the quality and accuracy of AI-generated content can vary, potentially leading to misunderstandings or misconceptions.

This experiment taught me that using AI in education demands better time management and simplified tasks, as students sometimes felt overwhelmed and disoriented.

In this context, "less is more". I should have focused on teaching students to summarise and ask questions about the video. At this level of English, it is also advisable to

use audio tracks with video or visual prompts to aid students' understanding of spoken English.

Beginners without visual aids often feel disoriented, and listening activities without a visual component may pose an additional challenge.

d) Relevance of the findings

In the future, it is crucial to investigate the best ways to integrate AI with conventional teaching techniques. Although AI has advantages, teacher-student interaction remains necessary for effective language acquisition. By carefully weighing the advantages and disadvantages of each strategy, teachers can design a more thorough and successful learning environment for learners.

AI can help non-native speakers of a language become familiar with a target or foreign language. However, language learners will not experience the desired outcome if they fail to have a consistent study routine and do not "force" themselves to listen to audio format contents such as podcasts and songs and test their knowledge regularly, using learning websites that provide listening exercises to test their listening ability.

Websites for learning English, such as The British Council, Test-English or BBC Learning English, offer many materials to help learners improve the four basic language skills. It is pointless to rely on AI tools if students do not use them responsibly and do not complement them with traditional techniques such as spaced repetition and shadowing. Apart from traditional materials, including flashcards and coursebook exercises, there is a plethora of apps to improve all language skills, such as TalkPal AI, Elsa Speak, LingoDeer, Babbel and Duolingo.

Beginners, especially those who have never learned a foreign language or did so a long time ago, require a precise roadmap outlining the steps to build confidence and persevere through challenging times. Hence, teachers must help learners see that motivation is tricky, unreliable, and quickly fades. Discipline, on the other hand, is more promising and vital to achieving tangible results. Learning a language is not a marathon but rather a journey that demands consistency, determination, patience, and resilience.

Bibauw et al. (2019) advocate that AI-supported teaching tools like chatbots improve communication and authentic social interactions and provide clear feedback. In today’s

world, chatbots are capable of creating authentic and meaningful social interactions (Clark, 2018) using various means, including text, audio, and visual features, while providing prominent and readily understandable feedback (Bao, 2019).

In addition, Akerkar (2014) and Ginsberg (2012) assert that AI can make intelligent decisions like humans, while Kim (2018) points out that AI's enhanced functionalities are practical tools for honing oral skills, especially in listening and speaking.

After the experiment and based on the participants' feedback, some adjustments are required when using AI in listening tasks since, in terms of the four skills, this activity was the least helpful, considering participants' feedback from the interview held in class. Having that in mind, new strategies, tools, and more time allocated for in-class practice and further explanations are indispensable in guaranteeing better results.

Encouraging the use of apps such as Elsa Speak, Babbel, or Duolingo in and outside the classroom can be an invaluable strategy that can be complemented by The British Council, Test-English or BBC Learning English websites that offer a wide range of listening activities. When using different materials, it is also worth trying audio tracks or videos that portray less habitual accents, as many teachers still opt for audio files in British and American English, which does not prepare and show students the multiplicity and richness of the various English accents that exist in the world. Accents and regional slang are also a part of the world-English culture sphere, not only the textbook English that most outdated books focus on, neglecting real-life English, which is also mandatory and necessary when students communicate with native speakers.

Additionally, using the mobile version of ChatGPT can significantly enhance students' listening skills. This tool permits students to ask questions, revise, and read what they are practising, promoting interactive learning and providing instant feedback. Incorporating this tool into the learning process can optimise language learning as students tend to benefit from a more interactive and collaborative learning environment. Generally, when their levels of engagement and motivation augment, the probability of achieving better results increases proportionally.

As Clark (2018) predicted, AI technology is becoming increasingly sophisticated. It can now maintain dialogue, remember past conversations, understand context, and adapt to

users' needs. Undeniably, AI is playing a substantial role in education. The traditional teacher-learner dynamic has changed.

Integrating AI into education transforms the learning environment and plays a notable role in creating personalised learning experiences and providing quick and tailored-made support and instruction. Notwithstanding, it is vital to examine the ethical implications of its use and ensure that AI is used to enhance and modernise the learning experience, not to replace teacher-student interaction or teachers' critical ability to assess and comment on students' work.

e) Lesson plan

Table: 5. 4: Listening with AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
1	Warmer (20 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Present personalised flashcards with vocabulary and grammar structures from a video - Read some words, phrases, and sentences related to the text	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Allow students to think about the topic and test their critical thinking and problem-solving abilities - Allow students to develop their ability to connect ideas and draw logical conclusions. - Provide guidance when needed	- Read out five sentences from the video to assess my students' comprehension and ask questions related to each of those sentences - Ask questions related to those five sentences	T —> Ss Ss —> T
3	Supervised and guided practice (20 minutes)	- Check the students' understanding - Assess their ability to connect ideas and draw logical conclusions - Use an AI tool to facilitate understanding	- Ask questions related to those five sentences - Review the correct answers and discuss any questions that may arise - Use an AI website called Jot Bot to create activities	T —> Ss (instructions) Ss —> T T —> Ss (guidance)

	Stage and time	Aim	Procedure	Interaction
4	Practice: pair work (performance) (20 minutes)	- Evaluate students' understanding of spoken English. - Assess their ability to connect ideas and draw logical conclusions with an AI-powered tool	- Listen to the previous short audio file - Do activities (multiple-choice and gap-filling exercises) created by Jot Bot	T —> Ss S —> S
5	Teacher's feedback (20 minutes)	- Use AI to deepen understanding - Help students identify and comprehend areas for improvement	- Review the correct answers and ask students if they have any queries about the tasks - Use Jot Bot to check the answers together	T —> Ss Ss —> T
6	Warm down (15 minutes)	- Explain to students how they can use AI to help them study and improve their listening skill	- Show students how Jot Bot can summarise videos, get transcripts, and create more learning activities	T —> Ss Ss —> T
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Provide instructions to students regarding the next activity	T —> Ss
	120 minutes	End of the lesson		

2. Reading

Goal(s) of the experiment

This activity was designed to test the reliability of incorporating Artificial Intelligence (AI) tools into reading activities for A1 English learners. Two reading activities were used to test the students' reading comprehension skills: one utilising a free AI tool and another relying on a traditional method.

2.1. Activity without AI

a) Materials and tools

Table: 5. 5: Reading activity without AI

Skill	Main Topics	Materials	Tools
Reading (without AI)	Places in a city Shopping	Web pages * Personalised flashcards	Internet
Reference(s) *	1. The British Council. (n.d.). *Places in a town* 1. Learn English - British Council. [Website]. https://learnenglish.britishcouncil.org/vocabulary/a1-a2-vocabulary/places-town-1 2. The British Council. (n.d.). *Shopping.* Learn English - British Council. [Website]. Retrieved from https://learnenglish.britishcouncil.org/vocabulary/a1-a2-vocabulary/shopping 3. *Cambridge English–Portuguese Dictionary: Translate from English to Portuguese*. (2024). https://dictionary.cambridge.org/dictionary/english-portuguese/ 4. Test-English. (n.d.). *Where are you going to shop? – A1 English reading test* - Test-English. https://test-english.com/reading/a1/where-are-you-going-to-shop-a1-english-reading-test/		

b) Procedure

Before the class

In the first stage of the experiment, students were instructed to prepare for the upcoming reading activities in the classroom setting, which would not include AI-powered tools.

Before the reading activity, students were asked to visit two websites (the links were provided in class). On the first website, they listed ten places or facilities in a city; on the second one, they wrote at least eight words and found their definitions. On both websites, they had additional activities. Engaging students in note-taking during their studies was vital as it helped them memorise new words and expressions and facilitated comprehension. It encouraged students to pay attention while reading instead of being passive readers.

When visiting the first website, they created a list containing ten places or facilities in a city and did the activities. On the second website about shopping, students copied at least eight words and found their definitions online in the Cambridge Dictionary or a similar dictionary. These exercises were designed to prepare students for the topic to be discussed in the upcoming class. I reviewed and provided feedback on their homework in the next class.

In the classroom: reading activity

The instructional plan was designed to facilitate reading comprehension and vocabulary acquisition. It consisted of four key components:

1. Listening and learning: In the first part of the lesson, I read an email aloud while showing related pictures to aid understanding. Before starting the activity, I explained what they would be doing in class and asked closed-ended and open-ended questions about their neighbours and places/facilities near their houses.

2. Word detectives' activity: In this activity, students were asked to underline all the words they were not familiar with, use context to comprehend meanings, and engage in peer collaboration. They were allowed to use dictionaries whenever needed.

3. Quiz time: After the peer collaboration, students completed individually a true or false quiz followed by a multiple-choice quiz to assess their comprehension after reading. The correct answers and a quick explanation to aid understanding were provided afterwards.

4. Reading aloud: Students took turns reading the email aloud to improve fluency and boost their confidence when speaking in front of others.

This instructional approach was designed to create an engaging and supportive learning and skill development environment.

c) Findings after the experiment

The traditional method, including pre-reading activities and teacher guidance, was effective but had limitations in terms of instant feedback. Providing individual feedback in a classroom setting can be challenging when teaching larger groups. Balancing individual feedback with each student's pace and lesson plan is often a delicate task or a pipe dream.

The pre-reading activities provided a solid foundation for understanding the text, and the note-taking strategy impelled students to focus on the given activity and construct meaning.

Students worked together in this activity without AI tools, received general feedback, and did activities to ensure effective learning. Additionally, reading aloud helped students improve their fluency and confidence.

After the activity without AI, it was time to see how using AI in the reading activities could affect learners' performance and feedback.

Furthermore, exploring various assessment methods, providing techniques to help students understand the gist of written content more rapidly, and offering differentiated instruction with or without AI assistance can facilitate students' reading (e.g., word stress, rhythm and intonation) and enhance their comprehension ability.

Apart from multiple-choice questions, true or false statements, matching activities and putting jumbled sentences or pictures in the correct order to assess comprehension, teachers can create original and fun activities with or without AI interference.

Here is an example of an activity that can be used with A1 learners of English:

1. Selecting a simple picture book with clear illustrations and familiar vocabulary to match the learners' language proficiency.

2. Reading the story aloud, pausing after each page to allow learners to observe the illustrations and make predictions. This activity promotes active listening and the use of their imagination.

3. Splitting learners into pairs or small groups and asking them to retell the story in their own words is a fantastic way to foster teamwork skills and spark their imagination and creativity.

4. Providing learners with a blank sheet of paper to continue the story inspired by the book they heard is fundamental to solidifying the new information as they have to remember, write, talk about, and read the continuation of the story. When students are asked to express their creativity and practise their skills, they are more inclined to engage in the activity and learn more from it. Humans usually acquire new knowledge more rapidly and efficiently while having fun or doing tasks that matter to them.

According to Clearwater's publication "Understanding the Science Behind Learning Retention" on Indigene's Website, a logical and practical sequence of reading activities can improve the learner's capacity to retain and use new information. Those techniques are as follows:

1. Teaching vocabulary to help students become familiar with new vocabulary before exploring it on a broader scale.

2. Breaking down a text into smaller chunks to ensure better retention.

3. Using a multimodal approach featuring visual, auditory, and kinaesthetic elements to increase engagement and interest.

4. Using storytelling because stories make information more engaging and relatable, improving learning and retention simultaneously. Weaving relevant and compelling stories strengthens learners' connection with the new content.

5. Opting for games that involve earning badges for completing tasks, for instance, encourages healthy competition and augments new knowledge retention.

In need of inspiration, students are a great source of ideas and can work alongside teachers who shape and fine-tune activities.

Learners should be seen as passive individuals. On the contrary, they should be encouraged to take part in the learning process and taught to tackle their difficulties as they appear.

Evidently, there are reading techniques that yield faster results than others. Based on my experience as a teacher and student, skimming and underlining the text's most fundamental elements leads to a faster and more profound understanding of its message(s). For example, identifying keywords and visualising the sequence of events can aid readers in pinpointing the most critical details. This strategy includes focusing on the people/characters involved, dates, times, places, and the reasons behind a particular situation. Following those steps makes identifying and retaining the key information in a text more manageable.

After that, learners need to read each line and paragraph more attentively. They can create tables or mind maps to retain information longer and jot down the main insights or ideas. Students can supposedly connect the dots and critically think about the topics at this stage of the reading and comprehension process.

Finally, students who summarise and reflect on texts tend to remember and explain them to others more naturally and confidently.

Another great way to retain information is to discuss it with a peer or in class or join a reading club suited to the learners' proficiency level and interests. Also, connecting existing and new knowledge leads to long-term memory retention. Isolated or fragmented information without context usually results in a poor understanding of texts and their hidden messages. Understanding a text to its fullest often requires reading between the lines to grasp what the characters convey through words, tone, figures of speech, or punctuation.

Beginners with no experience or poor study habits in learning a foreign language must understand the importance of a consistent study routine that includes practising reading regularly alongside other skills right from the start. Therefore, implementing a routine and staying consistent is critical for achieving good results. Not having the right mindset, effective learning strategies, and measurable goals often culminate in failure.

d) Relevance of the findings

This activity fostered collaborative learning by encouraging students to work together to find the meanings of unfamiliar words. It also promoted active learning as students explored the content and took quizzes.

Collaborative learning and peer teaching are two of the most effective active learning methods. Gerlach (1994) highlights that collaborative learning environments benefit

students since collaboration affects their intellectual and social development. Similarly, McKeachie et al. stress that students teaching other students is a highly effective teaching approach (Sorcinelli, 1991, p. 17).

Three perspectives back the concept of collaborative peer teaching.

The first perspective, the cognitive approach, suggests that learning is more productive when students engage with information meaningfully, like organizing it, connecting it to prior knowledge, and applying it in new contexts (Svinicki, 1991, p. 30). For instance, students can actively explore course material by finding different ways to explain it to their peers.

The second perspective, motivational theory, focuses on the factors influencing learning initiation and its sustainability. It also states what learners and teachers must do: learners must take ownership of their learning, while teachers are responsible for innovating the learning experience (Forsyth and McMillan, 1991, pp. 55, 63).

In the third perspective, the social context, dialogue takes centre stage as collaborative and interactive environments are regarded as the most conducive to learning. Hence, teachers should share responsibility with students by involving them in course planning and decision-making ((Billson and Tiberius, 1991, p. 93).

In sum, collaborative peer teaching benefits both teachers and the entire class. When students take responsibility for their education in a cooperative and supportive environment, they learn more than taking a submissive role in the classroom. This shift of the usual teacher-student roles motivates learners to be more active and sparks their interest due to its innovative and bold nature (Forsyth and McMillan, 1991, pp. 55,63). Teachers and students can both explore and seek new ways to make the learning environment more experimental and not excessively theoretical.

Additionally, reading the story aloud in class helped students develop confidence in speaking in front of their classmates. Confidence is of the utmost importance in language learning, as many students, especially beginners, usually feel embarrassed or self-conscious when speaking in public. As we know, the fear of speaking in front of others hinders their progress and may culminate in abandoning the goal of speaking English or other foreign languages.

By reading aloud, learners have an excellent opportunity to expand their vocabulary and improve their pronunciation. (Griffin, 1992, p. 784).

Griffin (1992) concludes that many teachers believe that ESL learners should read materials that are meaningful to them and connect them to topics discussed in previous listening and speaking tasks. Having that in mind, it was necessary to expose students to comprehensive input (e.g., a message to a new neighbour) by introducing the reading material and reading it aloud. After that, to foster peer collaboration, they looked up unfamiliar words in dictionaries and worked together to help each other understand the email. In order to assess their understanding of the text, they did exercises individually.

After providing the correct answers, students read a small email excerpt. The point here was not to assess their reading formally but to check the words they had more trouble pronouncing and their ability to connect words (connected speech).

When beginners are asked to read aloud, the focus naturally shifts from meaning to pronunciation. After addressing the meaning of the text, teachers can focus on pronunciation. With positive reinforcement and constructive feedback, pronunciation practice, such as addressing specific problems with word stress, individual sounds, or intonation.

In the following activity, it is possible to identify the advantages and disadvantages of using AI in reading activities compared to this activity, which favours a more traditional teaching approach to exploring students' reading abilities.

e) Lesson plan

Table: 5. 6: Reading without AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
0/7	Instructions: Preparation at home (in the previous class)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Students will be asked to visit two websites and do the activities on the websites along with two lists of vocabulary - Take notes and write down vocabulary from the video	T —> Ss
1	Warmer (20 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Ask closed-ended and open-ended questions about their neighbours and places/facilities near their houses	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Give students the opportunity to think about the topic and test their critical thinking and problem-solving abilities. - Allow students to develop their ability to connect ideas and draw logical conclusions - Provide guidance when needed	- Read a text aloud while showing related pictures to aid understanding - While reading, I will show students flashcards related to most paragraphs	T —> Ss Ss —> T
3	Supervised and guided practice: pair work (20 minutes)	- Check the students'' understanding - Assess their ability to connect ideas and draw logical conclusions	- Underline all the words you do not understand - Look words up in an online dictionary	T —> Ss (instructions) S —> S T —> Ss (guidance)

	Stage and time	Aim	Procedure	Interaction
4	Practice (performance) (20 minutes)	- Evaluate students' understanding of written English - Assess their ability to connect ideas and draw logical conclusions	- Students take a true or false quiz - Students complete a multiple-choice quiz	T —> Ss
5	Teacher's feedback (20 minutes)	- Help students identify and comprehend areas for improvement	- Correct the answers and ask students if they have any queries about the tasks	T —> Ss Ss —> T
6	Warm down (15 minutes)	- Boost students' confidence in public speaking	- Some students will reread the whole text in front of the class.	T —> Ss Ss —> Ss
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Provide instructions to students regarding the next activity	T —> Ss
		End of the lesson		

2.2. Activity with AI

a) Materials and tools

Table: 5. 7: Reading activity with AI

Skill	Main Topic	Materials	Tools
Reading (with AI)	Shopping	Web pages *	AI chatbots Internet
Reference(s) *	1. Test-English. (n.d.). *Online shopping – A1 Reading test - Test-English*. https://test-english.com/reading/a1/online-shopping/ 2. Google AI. (2024). *Gemini* [Large language model]. https://gemini.google.com/app 3. Microsoft. (2024). Copilot [Large language model]. https://copilot.microsoft.com/ 4. OpenAI. (2024). *ChatGPT* (GPT-4) [Large language model]. https://chatgpt.com/		

b) Procedure

In the classroom: reading activity

Firstly, I read and projected on the whiteboard a story aloud about a girl named Sara who loved shopping online and her shopping habits, preferences, and concerns. Then, I asked students closed-ended and open-ended questions about their shopping preferences and habits to assess their understanding of the text.

Working in pairs, students underlined all the words they did not understand and looked them up in an AI-writing tool such as Gemini, Copilot, or Chat-GPT.

Then, they opened one of those AI-writing tools. They used the following prompt before copying the words or expressions they did not fully understand. They were told to copy the paragraph where that word was. They used the prompt: Explain the meaning of the word "[write the word or expression here]", summarise the sentence and provide three synonyms. Here is the sentence: (…) Look at the example: Explain the meaning of "careful",

summarise the sentence and provide three synonyms. Here is the sentence: Of course, bad things sometimes happen, but I am cautious with my personal details.

If students had trouble understanding the definitions or explanations, they used the following prompt: Translate what you have just written from English into Portuguese.

After reading, students took a quiz individually to assess how much they remembered. There were five questions, and they had to decide whether the statements about the text were true or false.

Once they finished that quiz, I asked five students to read one of the questions from the quiz and choose the answer they thought was correct. This quiz helped them see how well they understood the text and showed me whether they needed further practice or additional help. Students tried answering the questions by themselves first, then copied the text into an AI Chat, asked it to answer each question, and then confirmed if the answers were correct. I told them the correct answers afterwards.

Following the true and false quiz, students were required to demonstrate a deeper understanding of the text through a 7-question quiz, with three options for each question.

After completing the quiz, eight students shared their answers, and I provided the correct responses. Students tried answering the questions by themselves first, then copied the text into an AI Chat, asked it to answer each question, and then confirmed if the answers were correct. I told them the correct answers afterwards.

Finally, I showed students how to listen to a text with AI - https://ttsmaker.com/.

Then, it was the students' chance to read! They took turns reading the story together, one sentence at a time. This strategy was a great way to practise saying the new words they learned and reading smoothly.

c) Findings after the experiment

The AI-assisted activity provided immediate feedback and helped students translate words from English into Portuguese whenever necessary, allowing them to explore new vocabulary and expressions independently.

Most students felt comfortable with these activities as constant assistance and clarification were provided throughout the class.

AI-powered tools such as Gemini, Copilot, or Chat-GPT offer instant feedback, which makes the teacher's correction task easier. The main concern discussed in class was that students' overreliance on AI chatbots could hinder or harm their learning when misused. These AI tools have been designed to assist human creativity and work, not replace them. Human expression is unique and multifaceted, making it nearly impossible for AI to replicate fully.

All in all, the reading activity with AI offered immediate feedback and collaborative learning opportunities because students had to look up unfamiliar words and work together. At the end of the class, students took turns reading a story aloud in front of the class to boost their confidence and develop their public speaking ability.

Both activities showcased positive outcomes, but the activity involving AI was particularly intriguing and captivating for students unfamiliar with AI chatbots. Students with weaker ICT skills found the activity challenging in the beginning. Later, with the support of their peers and me, they found the use of AI in their learning routine as a breath of fresh air.

d) Relevance of the findings

The AI-assisted activity provided immediate feedback and helped students translate words from English into Portuguese whenever necessary, allowing them to explore new vocabulary and expressions independently.

Learning is more enjoyable and engaging when students see the purpose of the tasks and have the opportunity to work in pairs or smaller groups.

Most students felt comfortable with these activities as constant assistance and clarification were provided throughout the class.

The reading activity with AI offered immediate feedback and collaborative learning opportunities because students had to look up unfamiliar words and work together. At the end of the class, students took turns reading a story aloud in front of the class to boost their confidence and develop their public speaking ability.

As a teacher, my focus shifted from providing direct instruction to monitoring and verifying AI-generated answers.

It is fundamental to point out that overreliance on AI can hinder or diminish students' critical thinking and problem-solving skills. To avoid this, teachers need to remind language learners that their real-life language skills will be tested, and only those who actually study and commit themselves, not over-rely on AI tools, become fluent and master the language gradually.

According to Scott (2021), artificial intelligence (AI) has made remarkable breakthroughs in recent years, demonstrating capabilities that were once thought to be exclusively human. However, despite its impressive advancements, AI remains fundamentally constrained by its epistemological foundation. Assuming that one day AI will surpass or replace humans' creativity and problem-solving ability is unreasonable at this point. On top of that, AI models may never understand the inner conflict that most humans encounter when making decisions or assumptions that may demand reasonability and emotion simultaneously. Reading involves more than the reader's ability to understand the literal aspects of a text, as authors also use figurative language to embellish and make it more profound.

Scott (2021, pp.192-103) advocates that the human capacity for knowledge acquisition and retention is a cornerstone of our existence and is responsible for shaping our learning, ethics, and behaviour. While AI can replicate certain aspects of learning and knowledge production, it is inherently limited in its ability to totally read the complex human mind and, therefore, unable to understand how emotion and reason influence humans' interpretations. When it comes to reading, there is so much more than meets the eye.

Intentionality, morality, self-reflection, identity formation, and virtuous behaviour are all unique qualities that distinguish humans from machines. These elements of consciousness, with their depth of understanding, self-awareness, and moral agency, underscore the unique nature of human consciousness that AI is not likely to replicate.

Even though AI can process information rapidly and follow complex rules, it lacks the capacity for genuine intentionality. Its actions are primarily driven by algorithms and data rather than a conscious desire or purpose, which is an undeniable human feature.

Moreover, AI's decision-making process, often based on objective criteria, underscores the limitations of AI in understanding the subjective values and emotions that often guide human decision-making and judgement. In other words, AI can help humans

create and interpret texts more rapidly, providing insights and hints that may accelerate those processes. However, it still fails to add the emotion and reasoning that each human spontaneously conveys through personal word choice, figures of speech, and punctuation.

Learners usually need to read and understand what is intended in each paragraph, text, or chapter, but also connect ideas, ask questions, and draw conclusions to understand it fully.

Critical thinking is an ability that educators must help learners develop, as AI models' interpretation and capacity to deliver factual and original information are dubious or incorrect and cannot be taken for granted.

Skarlatos (2024) refers to today's AI models' unpredictability and misleading nature in this line of thought. When these models "hallucinate", they make factual errors and produce false or misleading information. In addition, their cultural and gender biases and the fact of generating explicit or harmful content are also issues to be considered in the education field. One of the educators' concerns is that students may overuse AI models to cheat on homework without being easily detected, and the models eventually replace human instructors. When correctly used, education can benefit from AI models, improving student outcomes and providing quality education. However, if they are unregulated and the risks are neglected, both students and teachers could suffer greatly, and education as we know it could be existentially threatened.

A study by Khan and Mutawa (2021) verified how effective AI-based personalised reading platforms improved the reading comprehension skills of Arab learners of English as a foreign language (EFL). After considering each learner's reading level, areas of interest, and language proficiency, the platform would suggest personalised reading materials. Based on the findings, it was concluded that the platform significantly enhanced learners' reading comprehension skills and augmented their motivation and engagement in reading activities. Notwithstanding, Hidayat (2024) warns that further research is still needed to explore the effectiveness of AI-based personalised reading platforms in teaching reading.

D'Mello and Graesser (2012) also concluded that AI-based learning platforms can effectively enhance learning outcomes by providing real-time feedback to students. These results support the effectiveness of personalised reading platforms in improving reading comprehension skills.

Overall, AI-based personalised learning platforms have the potential to enhance learner outcomes and provide real-time feedback tailored to individual students. However, further research and discussions are essential to address the existing risks, including concerns about student misconduct when using AI, the reliability of these technologies, and the potential impact of AI advancements on the role of human teachers in education.

e) Lesson plan

Table: 5. 8: Reading with AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
1	Warmer (20 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Ask closed-ended and open-ended questions about their shopping preferences and habits	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Give students the opportunity to think about the topic and test their critical thinking and problem-solving abilities - Allow students to develop their ability to connect ideas and draw logical conclusions - Provide guidance when needed	- Read a text aloud while showing related pictures to aid understanding - While reading, I will show students flashcards related to most paragraphs.	T —> Ss Ss —> T
3	Supervised and guided practice: pair work (20 minutes)	- Check the students' understanding - Assess their ability to connect ideas and draw logical conclusions - Use an AI tool to facilitate understanding	- Look words up in an AI-Writing tool - Help students use prompts to maximise their learning	T —> Ss (instructions) S —> S T —> Ss (guidance)

	Stage and time	Aim	Procedure	Interaction
4	Practice (performance) (20 minutes)	- Evaluate students' understanding of written English - Assess their ability to connect ideas and draw logical conclusions with an AI-powered tool	- Take a true or false quiz - Copy the text into an AI Chat and ask it to answer each question - Students confirm if their answers are correct - Complete a multiple-choice quiz - Use an AI Chat again to help you check your answers	T —> Ss
5	Teacher's feedback (20 minutes)	- Use AI to deepen understanding - Help students identify and comprehend areas for improvement	- Review the correct answers and ask students if they have any queries about the tasks	T —> Ss Ss —> T
6	Warm down (15 minutes)	- Boost students' confidence in public speaking - Explain to students how they can use AI to help them study and improve their reading skill	- Show students how they can listen to a text they like with AI and its features - Some students will reread the whole text in front of the class (other students, not the same ones)	T —> Ss Ss —> Ss
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Provide instructions to students regarding the next activity	T —> Ss
		End of the lesson		

3. Writing

Goal(s) of the experiment

This activity explored the effectiveness of integrating Artificial Intelligence (AI) tools into writing activities for A1 English learners. Two written activities were used to test the students' writing skills: one utilising a free AI tool and another relying on traditional methods.

3.1. Activity without AI

a) Materials and tools

Table: 5. 9: Writing activity without AI

Skill	Main Topics	Materials	Tools
Writing (without AI)	Daily routines	Videos * Personalised flashcards	YouTube Internet
Reference(s) *	1. English Panda. (2021, April 19). *Talking about daily routines in English (present simple)* [Video]. YouTube. https://www.youtube.com/watch?v=kePBvNotYy4 2. Vocab App - Learn English Words. (2023, February 6). *My Daily Routine | Learning English Speaking Level 1 | listen and practice #01* [Video]. YouTube. https://www.youtube.com/watch?v=rvtn6dd7Vkg		

b) Procedure

Before the class

Before the written activity, students watched two videos about daily routines. While they watched, they thought about their own daily routines, took notes and wrote down vocabulary or some example sentences from the videos. This preparation task helped them broaden their vocabulary and understand how to express themselves in the present simple.

In the classroom: writing activity

First, I asked open-ended and closed-ended questions about their daily routines. While asking those questions, I wrote collocations and phrases related to my students' daily routines. The task required students to list their daily activities using simple verbs, such as "get up," "have a shower," "have breakfast," "walk the dog," "take my son/daughter to school," "go to work," and "start work."

After compiling that list, students organised their activities into a short text depicting their daily routine. Afterwards, they exchanged papers with a classmate to review and underline any words or sentences that seemed incorrect in each other's routines. Then, I collected everyone's work and corrected any spelling or grammatical errors, underlined unnatural sentence structures, and added any missing words.

At the end of the class, students worked in pairs, wrote five sentences about their daily routines, and read them to the class.

In the traditional writing activity without AI-powered tools, students prepared themselves for the following class by watching videos about daily routines and taking notes, which helped them expand their vocabulary and understand the present simple tense. The writing activity in class involved loco questioning and peer review, enabling students to talk about their daily routines and receive teacher and peer feedback.

Only online and printed dictionaries were used to aid students in writing their routines.

c) Findings after the experiment

In most of my classes, I apply the scaffolding teaching technique in which teachers explain new content, provide guidance early, and gradually remove assistance as students master the new concepts and become more competent.

This activity without AI chatbots posed some predictable challenges. It required almost uninterrupted teacher assistance and feedback and was significantly time-consuming and demanding, as I had to correct all the written work in class.

On the positive side, students could only rely on their creativity and knowledge, which was a magnificent teaching strategy to foster their problem-solving skills, critical

thinking, peer collaboration, and good learning practices based on hard work, determination, proactivity, and resilience.

This method has been designed to provide students with a solid foundation for learning as they develop and deepen their information, much like scaffolding does on a building. As soon as learners acquire the desired level of understanding or proficiency, the teacher can withdraw and gradually stop providing guidance.

The preparatory task, which involved taking notes, the production phase based on the topic, peer collaboration and review, and reading aloud, attained the class's goal.

Regardless of the activity's nature and objective, insisting on taking notes while studying or being exposed to new content is paramount as it forces students to focus on what they are writing and read it to ensure it conveys the correct message or idea. Undoubtedly, handwriting and manually crafting materials to aid memory retention have proven effective.

Handwriting helps create stronger connections between the brain's visual, sensory, and motor areas. This process involves seeing something, processing it, and then physically writing it down. This action strengthens the link between the visual information and the motor action, making it easier to remember and recall information. It is like turning an idea into reality, which helps solidify the concept in one's mind (Hu, 2024).

In "Why Writing by Hand Is Better for Memory and Learning," Hu explains that when taking notes, learners pay more attention to the information collected and process it—prioritise it, consolidate it, and attempt to associate it with previous content learned. Thus, building on your existing knowledge can make learning new concepts more effortless and engaging (Dong et al., 2020, p. 8).

Additionally, Sivashankar et al. (2021) warn that excessive reliance on technology can lead to cognitive decline. While devices offer access to a plethora of resources, over-reliance on them can impair memory and other cognitive functions.

To store and retrieve information from memory, we must handwrite it unless the goal is to consign it to oblivion in the short term.

d) Relevance of the findings

This activity was designed to improve the writing skills of A1 English learners. It focused on daily routines, which required the use of the present simple tense and some

collocations related to the topic. With this activity, students had the opportunity to acquire new vocabulary, use and test their grammar knowledge, and develop their writing and speaking abilities.

When employing questions, peer review, and teacher feedback, students have a more comprehensive foundation to support, develop and combine new and previous information.

Encouraging group and pair work tasks is one of the best ways to improve our students' writing skills and develop their teamwork abilities. Furthermore, motivating students to experiment and take risks is paramount. Making mistakes is an inevitable and positive part of the learning journey. There is nothing wrong with that if there is teacher guidance, clear explanations and regular feedback. Students' dedication is also crucial to noticing progress and achieving good results.

Overall, teachers must always seek constructive feedback and ensure guidance by monitoring their students' writing progress and continuously sparking their critical thinking and curiosity. Teachers must also encourage students to seek knowledge outside the classroom.

By demonstrating the importance of receiving feedback from peers and how it can enhance writing skills, I make students aware of the benefits of collaboration in achieving success; "Two heads (or more) are better than one."

In most activities, repetition is intended to solidify the input that students acquire at home and then revisit and use in the classroom setting. Repetition is key to learning more rapidly and effectively.

N. Ellis (2002) argues that language comprehension is heavily influenced by the frequency with which words and phrases occur in a listener's native language. Considering this, language learning is not primarily driven by innate rules but rather by the statistical patterns observed in the linguistic environment.

Learning occurs as the learner forms associations through exposure to repeated patterns. Complex networks are created when new associations and links are formed between larger units. Larsen-Freeman (1976) proposed that the acquisition order of morphemes is influenced by their frequency of occurrence, supported by N. Ellis and Schmidt (1997). Within the framework of connectionism, learning occurs through stronger patterns as

students utilise them repeatedly. When learners extract regular patterns from input, even without conscious awareness, they strengthen associations.

Regarding adults, the second language acquisition process differs from that of younger learners as our brains are not as fresh or somehow unconscious while learning. However, more mature brains can actually benefit from the conscious second language acquisition process compared to children's unconscious process (Cruz Martínez & Kerschen, 2020). Most adults assume that learning a language is more complicated and is not "free-flowing". The main difference between young learners and adults is that children tend to acquire a second language in a more unconscious process. In contrast, adult learners learn a foreign language mostly consciously.

Adults tend to be actively aware of the process when acquiring a second language, which involves thinking about grammar structure, conjugation and pronunciation, for example. Therefore, the learning process seems unnatural and becomes more intellectual for adults than young learners. Being "actively aware" or conscious during the process requires using the pre-existing knowledge and advanced understanding of the mechanics of the mother tongue (e.g., how to place words in sentences and their functions) to understand better what is required of the second language (e.g., the need for verbs) (Goodrich, 2017). Teachers should consider this feature when teaching beginners since their mother tongues will hugely influence them in the beginning.

According to Lightbown et al. (2013, p. 64), second-language learners may draw on the knowledge of previously learned languages.

Based on my experience, first-language influence is hugely noticeable in the early stages of learning a foreign language, pushing learners to seek similarities between their mother tongues and target languages.

The findings suggest that this holistic approach was effective and engaging for students.

e) Lesson plan

Table: 5. 10: Writing without AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
0/7	Instructions: Preparation at home (in the previous class)	- Emphasise to students the importance of preparing for upcoming classes to deepen their understanding of the topic and actively engage in the subsequent class activities	- Students watch two short videos related to daily routines - Take notes and write down vocabulary and example sentences from the video	T —> Ss
1	Warmer (20 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Ask open-ended and closed-ended questions about their daily routines - Make a list with collocations and phrases that students say on the whiteboard	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Allow students to think about the topic and test their critical thinking and problem-solving abilities - Allow students to develop their ability to connect ideas and draw logical conclusions - Provide guidance when needed	- Write down a list of activities students do on a typical day	T —> Ss Ss —> T
3	Supervised and guided practice (20 minutes)	- Check the students' understanding - Assess their ability to connect ideas and draw logical conclusions.	- Organise ideas and write a text about their daily routines	T —> Ss (instructions) Ss —> T T —> Ss (guidance)

	Stage and time	Aim	Procedure	Interaction
4	Practice: pair work (performance) (20 minutes)	- Evaluate students' understanding of written English - Assess their ability to connect ideas and draw logical conclusions	- Exchange papers with a classmate to review and underline any words or sentences that seem incorrect	S —> S
5	Teacher's feedback (20 minutes)	- Help students identify and comprehend areas for improvement	- Collect their written assignments and correct them. - Mention the most common mistakes (without saying who made them) -Provide clarification when needed	T —> Ss Ss —> T
6	Warm down (15 minutes)	- Check students' understanding and ability to use what they have learnt (peer work)	- Write five sentences about their daily routines and read them to the class	T —> Ss S —> S Ss —> T
7	Instructions (for the next class) (5 minutes)	- Emphasise to students the importance of preparing for upcoming classes to deepen their understanding of the topic and actively engage in the next class activities	- Provide instructions to students regarding the next activity	T —> Ss
	120 minutes	End of the lesson		

3.2. Activity with AI

a) Materials and tools

Table: 5. 11: Writing activity with AI

Skill	Main Topic	Materials	Tools
Writing (with AI)	Daily routines	Web pages *	AI chatbots Internet
Reference(s) *	1. Grammarly Inc. (2024). *Grammarly Premium* [Large language model]. https://app.grammarly.com/ 2. Google AI. (2024). *Gemini* [Large language model]. https://gemini.google.com/app 3. ZeroGPT. (2024). *Zerogpt* [AI content detector]. https://www.zerogpt.com/pt/		

b) Procedure

1. In the classroom: writing activity

Similarly to the previous activity without the use of AI, in this activity that involved AI-powered tools, students were asked to take five minutes to write down a list of activities they do in a typical. They used simple verbs in the present simple tense like “get up,” “have a shower,” “have breakfast,” “walk the dog,” “take my son/daughter to school,” “go to work,” and “start work.” After that, they used Gemini, an AI Chatbot, to obtain ten examples. They used this prompt:

“First, make a simple list in bullet points with ten daily routines that adults usually do daily. Then, provide simple example sentences for each routine mentioned above. Always use the first-person singular in the examples.”

After that, students wrote their daily routines on Google Docs and then used Grammarly, a free writing tool that corrects grammar errors and suggests text improvements. Thus, students verified those suggestions and made the necessary changes.

Following that, they opened Gemini and copied the following prompt into it: "Act like an English teacher and correct the following text, taking into account British English spelling and grammar rules. First, show the text with the errors in bold and then the same text with the changes made in bold. Finally, comment on the errors in English and then explain the errors made. Explanations should be summarised and simple, with other examples to illustrate."

As usual, I focused on providing feedback on content and natural flow within the text, not strictly grammar.

Finally, they chose a text from the Internet and used Gemini to paraphrase, summarise, and correct it. Then, I asked them to copy the summary into ZeroGPT and see what happened.

c) Findings after the experiment

With the aid of AI tools, I provided more support to my students, helping them improve their writing and better express their ideas. In this class, students had the opportunity to use AI to write a small text about their daily routines. Right from the start, both with and without AI, students were asked to write simple sentences in the present simple tense, using time expressions like "every day" or "at weekends", adverbs such as "usually" or "sometimes" and time connectors such as "before" and "finally". These words and expressions added colour, intensity, and charm to their writing. We know that overly long and incoherent sentences are unattractive to most readers. Just because my students are beginners with a limited grasp of English, which is natural and expected, does not mean they are forced to write dull and bland sentences. On the contrary, with some example sentences and encouragement to establish a consistent study routine, they can gradually achieve and celebrate small yet meaningful victories (e.g., knowing how to use adverbs of frequency correctly).

Based on my observations, most students enjoyed and achieved significant positive results using AI in this writing activity. To ensure their understanding of the natural order of words, I asked them questions about the most common position of adverbs of frequency and sometimes asked them to translate some verbs and nouns related to daily routines from Portuguese into English. Whenever needed, translations are always from their mother

tongue, Portuguese, to English; I find it ineffective and nonsensical to translate the opposite way as adult learners usually rely on their first language to grasp the meaning of words and expressions in the target language or second language (L2).

Based on my teaching experience and considering my students' positive feedback on using their mother tongue (L1) to teach English, it has been proven to be adequate to allow students to use Portuguese in the classroom. Using L1 benefits students as they feel more comfortable asking questions, can better understand nuances, and can more easily identify false friends.

When adults learn a second language, their brains work differently than children's. Adults use more parts of their brain to process language, while children mainly use the same parts they use for their first language (Beretta, 2011). As adults become more fluent in their second language, their brains start to work more like they do when using their first language, especially in understanding the meaning of words and sentences (Hahne, 2001).

The use of students' native language (L1) in teaching a foreign language (L2) has been a controversial topic of debate among scholars, professors and linguists for a long time. While some argue that it may hinder L2 acquisition, others consider that students' L1 can be beneficial in specific contexts, especially when taking the first steps in a second language or having never studied a foreign language.

Firstly, using L1 can facilitate understanding and comprehension of L2 concepts. Secondly, it can reduce anxiety and increase confidence among learners. Thirdly, it can help learners make and see connections between L1 and L2, leading to a deeper understanding of both languages. Finally, it can promote cross-linguistic transfer, where knowledge and skills learned in one language can be applied to the other.

The key to success is the strategic and conscious use of L1, always considering the learners' proficiency level and difficulties.

Strategically speaking, after the teaching and practice stages, students are aware that they must step out of their comfort zone and use the target language.

In short, A1 and sometimes A2 students, in particular, feel more relaxed and are more willing to ask questions that may arise while learning a foreign language if they know they can ask questions and listen to my explanations in L1 whenever necessary.

In addition, they feel less frustrated or anxious in the classroom and less likely to abandon classes. Learning a foreign language without proper support can be daunting and demotivating. Not using L1 (Portuguese) in my beginner's English classes would hinder their learning, and most students abandon the courses, as witnessed in the first years of teaching.

Practical activities in the classroom setting ensure the use of English, allow them to revisit what they learnt, and gradually refine and master the language with my continuous assistance and effortless reinforcement of motivation and good study habits.

Based on Krashen's "Input Hypothesis", learners acquire language only by understanding the messages they receive or by exposure to comprehensible language input. This model emphasises that for acquisition to occur, there must be a period of time that allows learners to process input without any pressure to produce output (Krashen, 1985).

Needless to say, it is fundamental to show students that repetition is "the mother of all skills."

Freeman (2003) states that "language learning is a process of habit formation. The more often something is repeated, the stronger the habit and the greater the learning" (Larsen-Freeman, 2003, p. 43).

Throughout the experiment, with the responsible use of AI chatbots, I saw significant benefits despite all the negativity surrounding AI in teaching. As I often say, there are other ways to verify whether a student wrote the assignment himself/herself or was just AI-generated. When in doubt, students are asked to explain their word choices and to produce a similar text in class. Additionally, today's educators are equipped with AI detector tools to identify the presence of text written by artificial intelligence; however, this is only sometimes reliable and requires conscious and reasoned analysis before accusing students of misconduct or dishonesty. Hence, it is crucial to prepare teachers to find more accurate and trustworthy ways to fairly judge students' work apart from detectors that cannot be taken for granted at present – digital teacher literacy.

During the experiment, students reportedly felt more comfortable making errors and less self-conscious when using chatbots to aid them in their written tasks. When students feel at ease, are motivated, and engage in collaborative tasks with peers, they are more inclined to participate and produce language, which any language teacher intends – digital literacy for learners.

Overall, the writing activity with AI was a great success, although a few students, mostly with low ICT skills, had some trouble using and comprehending the vast potential of AI chatbots.

d) Relevance of the findings

Using AI tools in writing activities presents its own set of challenges. While AI can offer personalised assistance and instant feedback, there are concerns about over-reliance on these tools and the temptation to fall into the plagiarism pitfall. With that in mind, educators, linguists and scholars must analyse its pros and cons, question their beliefs and views on teaching and modernise their practices. As time evolves, those who teach and study are urged to evolve or inevitably face the risk of falling behind the times, that is, becoming obsolete or outdated.

The rise of AI chatbots, including the controversial and pioneering ChatGPT, has raised apprehensions about students relying excessively on AI for their written assignments and the difficulty of detecting and distinguishing machine-generated content from genuine student work.

Some sceptics, technophobes, and avid followers of conventional teaching styles, generally teacher-centred, would love to terminate this technological frenzy. However, turning back the clock and stopping AI from interfering in our daily lives is nearly impossible at this point. Therefore, building some boundaries and striking a balance between leveraging AI tools for language learning and preserving teacher-student interaction in the classroom is utterly necessary.

On the one hand, establishing clear guidelines for using AI tools in education and developing robust plagiarism detection mechanisms are essential aspects to consider in the future. On the other hand, teachers must encourage and guide learners on their journey towards developing critical thinking and problem-solving skills. By doing so, students will feel more confident and less dependent on AI to express their ideas. Education institutions must address AI integration's limitations and ethical implications in language learning to ensure that it complements traditional teaching methods and simultaneously preserves academic integrity.

Like other similar AI chatbots, Gemini has some limitations, as it sometimes generates erroneous or dubious information, displays a limited capability to pinpoint potentially plagiarised texts, and struggles to produce original and convincing texts for specific audiences. In addition, AI texts usually follow a rigid and predictable structure and sources, when needed, are at times incorrect or do not exist. Thus, the most distracted learners with poor research and study habits may not realise that chatbots sometimes generate unrelated, inaccurate bibliographic information or non-existing articles.

When students over-rely on chatbots, including ChatGPT, to complete written assignments more quickly and effortlessly, they consciously or unconsciously stunt or weaken their critical and creative thinking skills. This reliance on AI tools has a negative impact on students' ability to think critically and creatively. Moreover, the chatbots' ability to create original content that might not be flagged by plagiarism or AI text checkers, especially when rephrased with tools like QuillBot, could make it challenging for teachers to differentiate between students' work and AI-generated text. As mentioned before, this unhealthy dependency on chatbots may create a climate of mistrust between educators and students and harm students' creativity, critical thinking development, and ability to express ideas clearly and precisely.

Barrot (2023, p.4) warns that chatbots like ChatGPT have “limited capabilities when checking for potentially plagiarised texts and adjusting the text to a specific group of audience”, “a certain level of template rigidity of writing”, “tends to follow a specific structure” and “inaccurate bibliographic information, or non-existent articles.”

Teachers play an indispensable role in helping language learners avoid becoming too reliant on these tools, which limits their critical and creative thinking and raises ethical issues. ChatGPT and other chatbots may threaten academic integrity and challenge writing instruction (King & ChatGPT, 2023; Rudolph et al., 2023; van Dis et al., 2023).

On a positive note, a study by Savin-Baden et al. (2015) found that students felt more comfortable and confident when using a chatbot for writing tasks on sensitive topics. This finding aligns with the six main advantages Fryer and Carpenter (2006) proposed regarding the affective benefits of chatbots.

Other studies on chatbots in L2 learning have shown that fear of negative evaluation from teachers and classmates can contribute to anxiety in L2 learning (Horwitz et al., 1986; Shamas, 2006). Having that in mind, using a chatbot for L2 writing practice can help reduce

learners' anxiety levels by creating a friendlier environment where learners feel comfortable taking risks and making mistakes. Therefore, chatbots can boost their language learners' confidence and thus positively impact their language learning (Fryer & Carpenter, 2006; Fryer et al., 2020).

Essentially, chatbots are great tools to help learners with all four basic skills of a language: reading, listening, writing and speaking. For instance, text-chat dialogues with a chatbot can serve as writing opportunities for students while providing a chance to read and negotiate meaning or correct mistakes naturally. In addition, they usually make corrections such as spell check or grammar corrections, which are currently popular among students. Other studies suggested incorporating these features into future L2 writing activities and assessments (Lee, 2020; Oh, 2020; Tsai, 2019).

The participants' positive opinions and curiosity towards using chatbots in L2 learning did not come as a total surprise. Most students revealed that they were keen not only to use chatbots for learning English but also for other purposes not debated in class due to their irrelevance to the study and limited time.

In conclusion, chatbots can improve student writing, especially when dealing with sensitive subjects. Chatbots can enhance students' confidence and overall writing performance by creating a more comfortable and supportive environment. It is expected that chatbots will become popular for language learning, and new advancements will probably bring features that we cannot even think of or imagine. However, more research is needed to understand how they can best help students learn languages effectively, as these chatbots have great potential to aid or divert students from pursuing knowledge. It is advisable to warn students that the greater the power, the greater responsibility is expected from those who use AI tools in their learning journey.

Shin (2019) concludes that chatbots are good enough for language learning despite being unable to match the human conversation level. This is an important factor to be addressed in the classroom, as these chatbots have not mastered the nuances and subtleties that only human-written text can convey. Additionally, these chatbots present some limitations as they may lack complete contextual understanding and subliminal messages, limited creativity and an absence of emotional intelligence, which humans can only perceive and produce at this point.

e) Lesson plan

Table: 5. 12: Writing with AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
1	Warmer (20 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Ask open-ended and closed-ended questions about their daily routines - Make a list with collocations and phrases students say on the whiteboard	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Allow students to think about the topic and test their critical thinking and problem-solving abilities - Allow students to develop their ability to connect ideas and draw logical conclusions - Help students use Gemini - Provide guidance when needed	- Write down a list of activities students do on a typical day - Use Gemini to write ten additional routines with example sentences	T —> Ss Ss —> T
3	Supervised and guided practice (20 minutes)	- Check the students' understanding - Assess their ability to connect ideas and draw logical conclusions. - Use an AI tool to facilitate understanding	- Organise ideas and write a text about their daily routines	T —> Ss (instructions) Ss —> T T —> Ss (guidance)
4	Practice: (performance) (20 minutes)	- Evaluate students' understanding of written English - Assess their ability to connect ideas and draw logical conclusions with an AI-powered tool	- Once students finish their text, they will use Grammarly, which offers basic grammar checks - Students review those suggestions and make changes as needed	S —> S

	Stage and time	Aim	Procedure	Interaction
4	Practice: (performance) (20 minutes)	- Evaluate students' understanding of written English - Assess their ability to connect ideas and draw logical conclusions with an AI-powered tool	- Students open Gemini and use a prompt to correct their texts and comment on their mistakes	S —> S
5	Teacher's feedback (20 minutes)	- Help students identify and comprehend areas for improvement	- Collect their written assignments and correct them - Mention the most common mistakes (without saying who made them) - Provide clarification when needed	T —> Ss Ss —> T
6	Warm down (15 minutes)	- Check students' understanding and ability to use what they have learnt - Explain to students how they can use AI to help them study and improve their writing and the dangers of over-relying to AI	- Explain to students how they can use AI to help them study and improve their writing - Let students copy a simple text from the internet, paraphrase, summarise, and correct that text using Gemini - Copy the summary into an AI detector	T —> Ss Ss —> T
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Provide instructions to students regarding the next activity	T —> Ss
	120 minutes	End of the lesson		

4. Speaking

Goal(s) of the experiment

This activity explored the effectiveness of integrating Artificial Intelligence (AI) tools into speaking activities for A1 English learners. The data collected helped me identify the advantages and disadvantages of AI-oriented activities compared to traditional methods. It was paramount to understand how AI tools can enhance students' speaking skills (e.g., accuracy, speed, intonation, expressiveness, or vocabulary use) and how it could boost their confidence.

4.1. Activity without AI

a) Materials and tools

Table: 5. 13: Speaking activity without AI

Skill	Main Topic	Materials	Tools
Speaking (without AI)	Ordering coffee and food	Videos * Personalised flashcards	YouTube Internet
Reference(s) *	1. Two-minute English. (2012, November 17). *Ordering Coffee - Learn to speak fluent English at a cafe* [Video]. YouTube. https://www.youtube.com/watch?v=LyoDt3egGHg 2. Gina Sciangula. (2021, June 21). *English File 4thE - Elementary - Practical English E2 - Coffee to take away - Buying a coffee* [Video]. YouTube. https://www.youtube.com/watch?v=ivucUab-GG0		

b) Procedure

Before the class

Before the speaking activity, students watched two videos about ordering food and drinks in a café. They were instructed to take notes and write down vocabulary or example sentences while watching the two videos. A copy, including the transcription of the videos,

was available on Google Classroom a week before they presented their dialogues in the classroom.

This preparation task aimed to help them feel more confident when ordering food and drinks in a café or restaurant.

In the classroom: speaking activity

With these activities, I investigated the efficiency of Artificial Intelligence (AI) language tools in enhancing A1 language learners' speaking skills. In a controlled classroom environment, an AI-assisted speaking activity and a traditional one were used to compare their efficiency, aiming to evaluate the impact of AI on the spoken English proficiency of A1 learners.

First, open-ended and closed-ended questions about students' favourite places to eat and their preferred food and drinks for breakfast were used to set the tone and gently introduce the main topic of the class. Second, in a collaborative environment, paired-up students created lists of useful sentences and questions related to cafes, covering everything from greeting the staff to placing an order.

Then, in the following activity, students identified typical food and drinks ordered in a café and discovered additional phrases relevant to café interactions. After that, pairs listed five dishes and drinks they would use in their dialogue. They did not have to use all of them, just three of them. Subsequently, each pair was instructed to write a simple dialogue of approximately sixty words.

Following that, I reviewed and provided feedback on each dialogue, helping students identify recurring mistakes and widely used collocations (e.g., have breakfast).

Briefly, collocations are pairs or groups of words that are usually used together. They are combinations of nouns and verbs, adjectives and nouns, or adverbs and verbs. Learning this early helps students sound more natural and express themselves more accurately and effectively.

After evaluating the dialogues and noting areas for improvement, feedback on pronunciation, grammar, and vocabulary usage was provided. Positive reinforcement throughout the classes augments students' comfort and confidence, which helps them produce more language deliberately and freely.

Finally, each pair shared their dialogue with the class, helping them prepare for real-life situations while boosting their confidence.

c) Findings after the experiment

In the activity without AI, students were less confident, as they were visibly enthusiastic about trying the ChatGPT app for smartphones to improve their speaking ability. Before using ChatGPT, other paid app options such as Elsa AI, Promova, Talkio AI, and Praktika were mentioned.

In both tasks, students were prompted to order food and drinks in a café or restaurant. Watching videos about the topic and taking notes outside the classroom increased their familiarity with relevant vocabulary and example sentences they could use in the given context.

Although the activity without AI was successful, it was not as appealing as the AI-assisted one, as students were visibly enthusiastic. Some initially showed mixed feelings and apprehension, quickly disappearing after the demonstration and the opportunity to try the app.

Regarding the activity without AI, although fruitful, it was challenging and more demanding as I had to correct all the dialogues in class and provide quick feedback afterwards.

In this activity, few students were prone to avoiding making longer sentences and developing their speaking abilities. They were unwilling to step out of their comfort zone and felt self-conscious and incapable of doing the task without making “many” mistakes. Being aware of that, students are encouraged to make mistakes in all my classes because that is an excellent way to progress. There is no learning without making mistakes first.

After the experiment, some aspects stood out: collaborative tasks, motivation, and positive affect strongly influenced students' speaking skills. Teachers should favour meaningful and applicable activities to their students' life experiences over traditional teaching, such as reading texts aloud. Establishing a motivating and engaging classroom culture designed to help students based on age, interests, and cultural background is paramount. The teachers have a vital role in designing and keeping a classroom lively.

Motivated learners are more likely to face their limitations and participate more actively when their classes spark their creativity and thought-provoking skills.

Ultimately, when teachers continuously supply positive emotions and the materials used in class are relevant and interesting, both learners and teachers benefit from classes that resonate with the learners' expectations, goals, and necessities.

d) Relevance of the findings

As a teacher, I consistently emphasise that errors are inherent in learning. Encouraging students to participate in dialogue creation, debates, and public speaking fosters a supportive environment where learners can practise and prepare for real-world situations without fear of judgment as they face similar challenges. When people face identical scenarios together in a controlled environment, they are more likely to communicate more naturally in real contexts as they have developed their confidence in the classroom.

Teaching strategies such as peer work and emotional factors are at play in learning English and can facilitate or inhibit students' speaking ability.

Collaborative tasks that are meaningful to students and can be used in their daily lives should be one of the main priorities in teaching foreign languages to adults. Unfortunately, some teachers still focus too much time and energy on textbooks that discuss topics and characters unrelated to the students. Classes should be about the students, not centred on books. At this stage of learning, learners seek to talk about themselves and express their needs, motivations and preferences. Although discussing other topics unrelated to students is also interesting and beneficial, beginners prefer to explore their realities before exploring other topics.

As language facilitators, teachers must create the ideal conditions, gather suitable materials, and utilise effective strategies to boost students' motivation. Classrooms must be dynamic places where the content is up-to-date and challenging yet achievable to learners' age and proficiency level. When students are encouraged to participate, share their opinions, and feel appreciated and respected, their chances of becoming engaged and interested in class increase significantly.

The Experiment

Teachers cannot directly influence students' intrinsic motivation for learning a second language, as their motivation is generally shaped by their background, life experiences, and attitudes towards the target language.

However, teachers can create a supportive classroom environment by providing stimulating activities that consider students' age, interests and cultural background. When students experience success, they feel more motivated to continue and have more chances of outdoing themselves. (Lightbown et al, 2013, p. 204).

Motivation also interferes with students' willingness to speak, so collaborative activities in pairs or small groups and debates are non-negotiable in good teaching practices. Additionally, oral presentations prepare students for real-life situations, giving them soft skills (e.g., speaking in public) and helping them master the language (the ability to construct longer and more complex utterances).

Although children learn languages faster than adults, adults and adolescents have the edge as they have the chance to consciously speak, understand and achieve proficiency in a new language. Not even native speakers can become proficient users of their mother tongue without serious effort and practice.

Intrinsic motivation is more important than extrinsic motivation as it helps learners maintain their eyes on the prize, strengthen their resilience, and build autonomy. Learners who do not depend on external rewards are more likely to achieve their goal of becoming confident speakers and achieving higher proficiency levels.

Research has also shown that mature adults manifest a greater number of inhibitions not only in language classes, where their attempts to speak in a foreign language are often fraught with embarrassment, but also in "natural" settings (e.g., living in a foreign culture). However, the necessity to communicate in "natural" settings usually overrides the inhibitions. (Brown, 2007, p. 71)

Above all, to acquire a foreign language, learners need to have a clear goal, know the benefits of pursuing that goal, and be resilient and consistent.

According to Stevick (1980, p.4), "Success [in language learning] depends less on materials, techniques and linguistic analyses and more on what goes on inside and between the people in the classroom".

Affective factors play a crucial role in language learning. On the one hand, they involve individual or personality factors such as self-concept/self-esteem, anxiety,

inhibition, attitudes, motivation, and learner styles. On the other hand, they are influenced by external aspects, particularly the relationship between teachers and students, which can either facilitate or hinder learning.

"Positive affect can provide invaluable support for learning just as negative affect can close down the mind and prevent learning from occurring altogether" (Arnold, 2011, p. 1).

Decades ago, Krashen (1985, pp. 81-82) cautioned about the detrimental effects of negative affective reactions. He stressed the importance of maintaining and promoting a positive affective climate in the classroom, as it can significantly impact the learning process.

As Chomsky stated (1988, p. 181), "The truth of the matter is that about 99 per cent of teaching is making the students feel interested in the material."

To sum up, affective issues are a central part of language teaching just as much as the content's quality and relevance. Consequently, educators need to create and promote learning environments where students feel safe and supported in order to overcome their emotional barriers and speaking limitations.

Beyond that, it is fundamental to tell students that their ability to speak more confidently and naturally considerably increases when they are exposed to various streams of listening input, including podcasts, songs and interviews in English.

There is only output (speaking) with a considerable dose of input (listening). When speaking about adult learners, only those who seek ways to broaden their vocabulary and grammar awareness regularly, deliberately or not, master the language.

Many students fall behind or quit before reaching the initially desired level of fluency as they do not allocate enough time for improving their speaking, writing, listening or reading skills. It is a pure delusion to conceive the idea that speaking will naturally evolve when learners of a foreign language assume they will reach a native-speaking proficiency just by socialising with them or with those who speak their target language.

Reaching fluency in adulthood requires an empirical and conscious approach. By testing their grammar and vocabulary accuracy and nuances, L2 learners can indeed master that language gradually and effectively.

e) Lesson plan

Table: 5. 14: Speaking without AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
0/7	Instructions: Preparation at home (in the previous class)	- Show students the importance of preparing for upcoming classes to deepen their understanding of the topic and actively engage in the next class activities	- Students watch two short videos about ordering food and drink in a café - Take notes and write down vocabulary and example sentences from the video	T —> Ss
1	Warmer (10 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Ask open-ended and closed-ended questions about my students' favourite places to eat and what food and drinks they prefer for breakfast	T —> Ss Ss —>T
2	Presentation (20 minutes)	- let students think about the topic and test their critical thinking and problem-solving abilities - Allow students to develop their ability to connect ideas and draw logical conclusions - Provide guidance when needed	- Students and I will talk about everyday food and drinks people order in a café and write phrases relevant to café interactions - Teacher writes the suggested sentences and questions related to cafés on the board	T —> Ss Ss —> T
3	Supervised and guided practice: Pair work (10 minutes)	- Check the students' understanding - Assess their ability to connect ideas and draw logical conclusions	- Pairs list five dishes and drinks they might want to use in their dialogue. They do not have to use all of them, just three of them.	T —> Ss (instructions) S —> S Ss —> T

	Stage and time	Aim	Procedure	Interaction
4	Practice: pair work (performance) (30 minutes)	- Evaluate students' understanding of written English - Assess their ability to connect ideas and draw logical conclusions	- Write a short café conversation with a classmate (about 60 words) - Use online dictionaries or online translators such as Deepl or Reverso - Write a short café conversation with a classmate	S —> S
5	Teacher's feedback (20 minutes)	- Help students identify and comprehend areas for improvement	- Correct and provide individual feedback to students - Help them identify the most common mistakes - Provide clarification when needed	T —> Ss Ss —> T
6	Warm down (25 minutes)	- Help students identify the most common mistakes	- Students will read their dialogues in class - Mention the most common mistakes to the whole class	Ss —> Ss T —> Ss
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Ask students to rewrite the corrected dialogue version at home and list their mistakes to help them identify common errors - Provide instructions to students regarding the next activity	T —> Ss
	120 minutes	End of the lesson		

4.2. Activity with AI

a) Materials and tools

Table: 5. 15: Speaking activity with AI

Skill	Main Topic	Materials	Tools
Writing (with AI)	Ordering coffee and food	Web pages *	Smartphones AI chatbots Internet
Reference(s) *	1. OpenAI. (2024). *ChatGPT* (GPT-4) [Large language model]. https://chatgpt.com/ 2. Google AI. (2024). *Gemini* [Large language model]. https://gemini.google.com/app (optional)		

b) Procedure

In the classroom: speaking activity

This activity involved using the students' smartphones and downloading the ChatGPT application. After installing the app and listening to the instructions, they had to create an account and learn how to use its microphone feature.

Then, to familiarise themselves with the chatbot, they were asked to request five useful phrases for a café or cake shop, along with their Portuguese translations.

Simple English (or Portuguese) prompts were provided to help students become more familiar with key phrases they can use in real-life dialogues in cafés.

Then, students simulated a conversation in English, being customers firsthand while the AI acted as the waitress.

After the conversation practice, students took into consideration the AI's feedback on their language use, including grammar and vocabulary use and suggestions for ongoing improvement.

Following the conversation practice, students wrote a short café conversation with a classmate and used Gemini or ChatGPT to correct their dialogue and comment on their writing skills.

As students finished their written conversation, they received individual feedback to help them identify their mistakes.

Subsequently, pairs started roleplaying a casual conversation at a café with ChatGPT.

This activity encouraged them to develop conversation prompts and navigate unscripted dialogue, fostering spontaneity and creativity.

Finally, students had the opportunity to ask me questions about ChatGPT and other similar chatbots. Letting students ask additional questions after experimenting new tools or materials makes perfect sense. This phase of the lesson is of the utmost importance because they could ask questions they would not be able to ask in the beginning and also look for clarification and curiosities regarding ChatGPT or other identical chatbots.

Students' questions and suggestions are the best ways to monitor and assess the quality of our teaching practices and the effectiveness of the materials and strategies implemented in class. Learners who feel heard and seen are more inclined to participate actively in classes, and thus, everyone benefits from this unparalleled contribution that inevitably turns classes into unforgettable experiences.

This activity sought to improve the students' speaking skills by providing practical, real-life phrases for cafés and immediate feedback. Overall, this activity permitted students to practise speaking in an imaginary safe, obtain instant corrections, and learn new vocabulary and expressions. This way, learners can gain more confidence and greater proficiency by using chatbots in speaking practice activities.

Simple prompts for vocabulary and key phrases that can be used in a café or cake shop

1. Greeting the waiter/waitress

Prompt: I am in a café and want to have breakfast. Help me greet the waiter.

2. Asking for recommendations:

Prompt: I am unsure about what to order. Help me ask the waiter for a recommendation.

3. Ordering food and drinks

Prompt: I have just decided what I am having for breakfast. Help me order white coffee and a cheese sandwich.

4. Paying the bill:

Prompt: I would like to pay now. Help me ask for the bill. I am paying with my debit card.

5. Saying goodbye:

Prompt: I am leaving the café. Help me say goodbye to the waiter in a polite manner.

Lesson instructions for students - Speaking activity with AI (script)

1. Open the app store (Google Play or App Store).
2. Search for ChatGPT - OpenAI and download the application.
3. Once the application is installed on your mobile phone, create a free account or link the application to your Google account.
4. Tap the app's microphone and say: "I'm learning English. Teach me eight useful and simple phrases that I can use as a customer in a café or cake shop. Translate them into Portuguese afterwards."

(Wait for the app to respond)

Now, let's simulate a simple conversation in English in a café. I'll be the customer, and you'll be the waitress. You can start. After responding, please correct my English.

(Wait for the app to reply)

5. Once you've finished, click on X to exit. Then, review everything that has been written and read the suggestions given by the chatbot regarding mistakes you made, words or expressions you didn't know and want to learn.

c) Findings after the experiment

The speaking activity with ChatGPT's chatbot allowed students to engage in collaborative learning, develop social interaction skills, and boost their comfort when speaking in public. However, few students faced limitations with the AI-assisted activity, including discomfort and feeling unfit due to low ICT skills.

After the explanation, demonstration, and hands-on practice, students read the entire conversation after each attempt and then explored the app's features.

While using speaking chatbots or other AI tools can be propitious, it is essential to consider their accessibility and comprehensibility for all learners, particularly those with weaker ICT skills or those who visibly mistrust AI tools.

During the experiment, there were some technical issues with ChatGPT's voice recognition feature. The chatbot also had some difficulties understanding lengthy utterances and students with a heavier Portuguese accent when giving prompts in English.

After quickly assessing the situation, students with heavier accents were instructed to repeat mispronounced words and to speak more slowly. Even though this strategy was effective, some students became too enthusiastic and talkative, slightly delaying the activities.

When previous instructions failed, shorter prompts were provided to facilitate communication between students and the speaking chatbot.

Nowadays, students have the possibility to practise their speaking thanks to various applications that include real-time feedback on their English, including not only the controversial ChatGPT but also Elsa AI, Promova, Talkio AI, and Praktika. Thus, with adequate guidance, consistent practice and monitoring, it is much easier to develop this skill than ever. Some decades ago, learners of a foreign language would not have the options that today's learners have in their hands. The main problem today is the excess of the information that is not always accurate, trustworthy or unbiased. That being said, teachers are supposed to guide and help learners find factual, reliable, and top-notch information and materials. It is so easy to get lost on the Internet these days.

Additionally, there are some pitfalls, including e-mail phishing scams and other risks that users still neglect when surfing the Internet, especially identity and data theft.

Teachers must assist students in using technology, including AI tools or software, and warn them about the Internet's dangers.

Regarding mobile phones, educating students about the importance of downloading and using apps from official and well-known online stores, such as Google Play or Apple Store, is crucial. This awareness will help learners navigate the immense digital world more safely and responsibly.

It is not recommended to depend exclusively on AI tools in class to promote interaction and to make students feel more interested and engaged in the activities. Despite their appeal and practicability, learners and teachers must cooperate and find a common ground. Overusing technology is harmful to students as they also need to work on basic and primordial skills in effective learning: handwriting, drawing, matching exercises and creating tables and mind maps to select and retain essential information, for instance.

Blending traditional activities with technology is feasible if teachers allow students to express their opinions and preferences more frequently and work towards the same goal: paving the students' road to fluency.

This activity also fostered collaborative learning among classmates and developed other crucial speaking skills, such as reading and writing. In classes, there is sometimes an evident favouring of a particular skill, but it is worthwhile to remember that other skills should be integrated. This approach strengthens students' abilities, reassuring them that they are taking part in well-crafted and desirably varied classes. All the four fundamental pillars of a language can operate in unison, even though some take centre stage in certain activities.

d) Relevance of the findings

This activity about AI chatbots, namely ChatGPT, the mobile smartphone version, was a great success. Participants became more familiar with this tool and had the opportunity to use it and explore its main features. Due to its interactive nature, students were visibly impressed by its speaking and on-the-spot feedback features. Although a few students initially encountered some challenges in using the chatbot, the activity was fruitful. Students had fun with it, were more easy-going and willing to use it in class and at home. As desired and expected, the activity also with ChatGPT sparked their curiosity.

As most teachers know, each class may come with its challenges, so teachers need to be prepared for unfavourable scenarios and masters of creativity and adaptability. In future activities, addressing the limitations encountered in this activity will be necessary by providing additional support and guidance for students who are more likely to struggle with technologies or feel less confident speaking in front of others.

Considering its advantages and risks, it is time to see how it all started and how chatbots can impact teaching and learning.

AI-powered chatbots have revolutionised the digital landscape, permeating every aspect of human interaction, including language acquisition, from reading and writing to listening and speaking (Dale, 2016). Among the myriad transformations these conversational agents have catalysed, their potential to redefine language learning is particularly noteworthy. At some point, chatbots will inevitably become indispensable companions in pursuing linguistic proficiency, offering learners unparalleled flexibility and accessibility in their educational endeavours. These AI-driven tools have already empowered many individuals to learn new languages at their own pace and convenience by providing personalised instruction, immediate feedback, and various linguistic resources. Thus, many believe this technology will revolutionise how we use gadgets, websites, and applications.

While early users of Eliza, a pioneering computer program for natural language processing (Weizenbaum, 1966), found typed text communication a breath of fresh air, today's users are predisposed to online interaction, which has gained more popularity in the past three decades. Saying the current generation is comfortable with online communication via text or speech, whether in synchronous or asynchronous formats, is an understatement (Vogels, 2019).

The Experiment

Speech recognition technology has transformed how we interact with computers and perceive communication. It allows us to dictate text, give commands, and converse with online agents who understand and speak, making them more natural and reliable language-learning partners. With smartphones' growing popularity and features, it came as no surprise that chatbots would be used to enhance language learning at some point (Howell, 2019).

In fact, chatbots have been around for decades, but the idea of using them for language learning has gained more popularity in recent years. In the early 2000s, Coniam (2004) studied two chatbots that could potentially help with language learning. Dave was one of those chatbots from the ALICE Artificial Intelligence Foundation. Coniam believed that Dave could be a great private tutor because he responded in perfect English, just like a real English teacher would do (Coniam, 2004, p. 160).

Mayer and Clark (2016, 2017) found that learners retain more information when it is presented in a conversational tone, by a human voice, and with onscreen agents that exhibit human-like gestures and movements.

Chatbots are a promising new tool for language learning, but they still need minor adjustments and further research to become more effective and reliable. Hence, developers should work with researchers, educators, and learners to create innovative chatbots that gradually meet most language learners' needs, expectations, and preferences.

As language learning partners, chatbots may play a unique role in helping individuals overcome barriers that traditional human partners may not address, as Fryer and Carpenter (2006, 2019) demonstrated:

1) Some students may opt for chatbots to practise language skills that human classroom partners are unable or unwilling to do;

2) The fear of making mistakes and appearing less than proficient is the driving force behind language learners' preference for using chatbots for practice rather than real partners.

As a matter of fact, some learners may prefer chatbots due to their fear of making mistakes and being judged or mocked by others, including their classmates. In addition, chatbots provide endless practice, allowing learners to experiment with new languages and consolidate their knowledge whenever and wherever they want. On top of that, unlike human partners, chatbots can offer a wider variety of languages, do not get tired and can be personalised. Despite all these benefits, learners must be resilient and persistent when facing initial communication challenges.

These chatbots still have a long way to go. Developing chatbots that identify and cater to specific needs, such as boosting confidence or providing extensive vocabulary and chunked language practice, can further enhance their effectiveness as language learning tools.

As Candello et al. (2017) suggested, simultaneous chatbots could ensure learners receive enough input to persist in their learning journey. Additionally, simulating conversations with celebrities, as proposed by Nguyen et al. (2017), has the potential to make learning more appealing and thus lead users to produce more language. Similarly, implementing chatbots tailored to the specific interests of language learners could enhance the learning process, making it more enjoyable and effective by offering a wide range of topics aligned with learners' interests, thereby significantly boosting their engagement (Nguyen et al., 2017).

Supporting students goes beyond the technical conundrum of using technologies in class; it is also vital to arouse their curiosity and find ways to keep classes meaningful and interesting. Additionally, it is essential to consider motivation and reinforce that failing and making mistakes are acceptable and natural. Needless to say, students with a consistent study routine are more likely to see progress and less likely to give up. There are various factors to consider when preparing classes, not only related to language teaching intricacies. When the goal of the activity, structure, and environment are not aligned and straightforward, there is a higher probability of having a group of students who look and feel demotivated, disinterested and, as expected, less participative. A teacher's worst error is creating lessons that do not consider or meet the students' needs and expectations.

Chatbots have emerged as powerful tools to make classes more engaging and surprising. These AI-powered conversational agents simulate human-like conversations, leveraging advancements in natural language processing. Today's chatbots have undergone substantial upgrades, especially in voice and text exchanges (Shah et al., 2016).

In conclusion, by blending traditional and AI-based speaking activities, teachers can refine classes to cater to various learning needs and styles. Even though AI can make classes more visual and dramatic, it still needs the human touch and supervision. When misused, chatbots may slow down and threaten the learning process. It is vital to weigh the pros and cons of using AI in speaking or other activities. Therefore, planning a class goes beyond

carefully selecting resources and materials; it requires a logical sequence of actions and strategies that help learners acquire new knowledge in a pleasant and engaging atmosphere.

e) Lesson plan

Table: 5. 16: Speaking with AI - Lesson plan

	Stage and time	Aim	Procedure	Interaction
1	Warmer (10 minutes) in the classroom	- Foster student engagement in the activity by piquing their interest in the main topic - Introduce questions related to the topic to incite curiosity and stimulate active participation	- Ask open-ended and closed-ended questions about my students' favourite places to eat and what food and drinks they prefer for breakfast - Download and install ChatGPT on their smartphones - Explain how it works	T —> Ss Ss —>T
2	Presentation (20 minutes)	- Help students use ChatGPT on their phones to practise and improve their speaking skills - Use ChatGPT to build up vocabulary and learn phrases that can be used in a café - Provide guidance when needed	- Help students use ChatGPT on their phones - Talk to the chatbot and request five useful phrases for a café or cake shops - Teacher provides simple prompts that students can use to learn key phrases to be used in a dialogue in a café	T —> Ss Ss —> T
3	Supervised and guided practice (20 minutes)	- Check the students' understanding - Assess their ability to connect ideas and draw logical conclusions. - Use an AI tool to facilitate understanding	- Students talk with ChatGPT following a script given in class - Students read the conversation and comment	T —> Ss (instructions) Ss —> T
4	Practice: pair work (performance) (30 minutes)	- Evaluate students' understanding of written English. - Assess their ability to connect ideas and draw logical conclusions with an AI-powered tool	- Write a short café conversation with a classmate - Use Gemini or ChatGPT to correct the student's dialogue and comment on their writing ability	S —> S

	Stage and time	Aim	Procedure	Interaction
5	Teacher's feedback (10 minutes)	- Help students identify and comprehend areas for improvement	- Correct and provide individual feedback to students - Help them identify the most common mistakes - Provide clarification when needed	T —> Ss Ss —> T
6	Warm down: pair work (25 minutes)	- Let students explore ChatGPT - Answering students' questions related to ChatGPT and its AI Chat feature	-Students will engage in pairs, roleplaying a casual conversation at a café with ChatGPT. This activity encourages them to develop their own conversation prompts and navigate unscripted dialogues, fostering spontaneity and critical thinking. - Students can ask me questions about ChatGPT and other speaking chatbots	T —> Ss Ss —> T
7	Instructions (for the next class) (5 minutes)	- Emphasise the importance of preparing for upcoming classes to deepen understanding of the topic and actively engage in the following class activities	- Provide instructions to students regarding the next activity	T —> Ss
	120 minutes	End of the lesson		

Chapter 6. The Interview

The Interview

Questions for the interview (after the online questionnaire and the experiment)

After carrying out the experiment, one-on-one interviews were conducted to enhance the robustness of the outcomes in order to sustain data previously collected and make the experiment more accurate and reliable. These interviews played an essential role in validating the findings that emerged from the questionnaires and experiment. This multi-method of data collection aimed to minimise probable biases while ensuring there was data concurrence. Hence, this final interview was designed to assess the impact of AI-powered tools on English as a Second Language (ESL) learning while using the flipped classroom approach. The main objective was to gather qualitative and quantitative data on students' perceptions of AI integration and its influence on their learning strategies, motivation, engagement, and overall learning outcomes.

The interview was divided into six sections, each serving a specific purpose. It started with a relaxed introduction to succinctly explain the purpose and importance of the interview, setting the tone for the rest of the interview. The five sections were organised as follows: general experience (section 1), learning strategies (section 2), motivation and engagement (section 3), learning outcomes (section 4), comparison and preferences (section 5) and open-ended questions (section 6). A table containing all the questions and objectives has been included on page 126 to avoid lengthy and extenuating explanations.

Questions from sections 1 to 5 consisted of pre-established questions designed to understand how AI influenced their learning experience compared to those without AI. Although students could choose from the options given, they were allowed to add their spontaneous answers or expand the given options. During the interview, the participants had a tablet or smartphone to read the questions and choose the desired answer after verbalising it. After their verbal response, they would select the desired on a Google Form. This procedure helped with data collection and made it possible to convert their answers into more appealing visuals thanks to pie and horizontal bar charts.

Audio recordings were not transcribed word-for-word to avoid excessive data; instead, edited summaries with bullet points were created to retain only the key information while omitting nonverbal cues for easier reading.

Although there were ten students at the beginning of the experiment, only seven completed all AI and non-AI activities; therefore, this phase's data is based on the seven students who participated fully.

Integrating quantitative and qualitative data highlights the advantages and disadvantages of using AI in language teaching, identifying both benefits and drawbacks for future pedagogical and technological advancements.

In this experiment, due to all the class preparation and subsequent reflection involved and the limited time available, most questions were standardised, and only two were designed to let candidates freely comment on the experience. Another carefully considered aspect for choosing more predetermined questions for the structured interview was that most students had little experience or no contact with AI-powered tools. Considering that it would be difficult for them to elaborate and develop their comments. Furthermore, lengthy and overly thorough interviews tend to produce less accurate results due to fatigue or lack of interest, which can lead to biased or insincere statements. In simple terms, candidates are more likely to disengage and show reluctance to participate.

A more straightforward and standardised approach helped me collect and analyse the data. This research's limitations in capturing the immense possibilities of AI in education make further field studies necessary to explore and build on the themes discussed. Therefore, this study merely scratches the surface of AI's complex and evolving role in the educational landscape. Consequently, more comprehensive field studies are needed to understand the interplay between AI technologies and educational practices.

According to Bryman (2012) and mentioned in M. Nor Rashidi, R. Ara Begum, M. Mokhtar, & J. J. Pereira, (2023) work, structured interviews offer the following advantages:

- Structured interviews ensure consistency in questions, reducing errors caused by variation.
- The specific nature of the questions minimises the impact of interviewer bias.
- Closed questions will facilitate the data processing, which will limit potential errors;
- The availability of predetermined answer choices makes clarifying general questions and completing the interview easier.

When applying the initial questionnaire and conducting the interviews, the Likert Scale, a practical measurement method used in research to measure respondents' opinions and

perceptions, was a valuable rating system that allowed efficient and simplified data collection and its posterior analysis. According to Bryman (2012) in "Social Research Methods," the Likert scale is a practical measurement method widely used in research that facilitates data analysis and comprehension.

Being aware that semi-structured interviews provide a unique opportunity to explore responses that were not initially anticipated (Ryan et al., 2009), two relevant open-ended questions were meticulously placed at the end of the interview. The first question asks participants for their ideas on how AI can improve language learning, while the second one asks them to imagine their ideal AI language learning tool for a flipped classroom and to describe its features. The ultimate purpose of these two questions is to gather participants' insights on how AI can be improved to enhance language learning, specifically in a flipped classroom context.

In general, when collecting data, researchers must create short and straightforward sets of questions that cover the most critical aspects to be studied and provide reliable and all the necessary details to draw conclusions that will benefit the current or future participants.

By analysing the experiment's positive and negative points and its limitations, further research will hopefully be able to tackle disregarded or unanticipated variants. Further research in AI applied to language learning and teaching is expected to bring new and remarkable findings that will allow scholars, researchers, and teachers to enhance the effectiveness of language teaching.

The initial questionnaire, experiment, and interviews were conducted after the participants had read and signed an informed consent form. This form succinctly explained the purpose of the research study and stressed the importance of their contribution to the experiment (Please see the appendixes).

Considering Buys et al. (2022), it is essential to consider ethical conduct in research, particularly during interviews. Researchers should prioritise participant confidentiality, create a comfortable environment, and demonstrate respect, openness, honesty, and positive feedback to ensure the validity and integrity of their research. In light of this, it is crucial to incorporate ethical attentiveness at every stage of the research process.

Table: 6. 1: Questions for the interview (summary)

Categories	Question		Objective
General Experience	Question 1	How would you describe your overall experience with the flipped classroom activities?	Evaluates the students' overall satisfaction with the flipped classroom model, providing a baseline for comparison between traditional and AI-integrated learning experiences
	Question 2	Did you feel the difficulty level of the tasks changed when using AI compared to those without AI?	Compares the perceived difficulty of tasks when using AI tools with those completed without AI
Learning Strategies	Question 3	Did using AI in the second set of activities encourage you to try different learning strategies?	Explores whether AI exposure encouraged students to adopt new learning strategies, indicating AI's potential to foster metacognitive skills and independent learning
	Question 4	Did AI help you complete the tasks more efficiently?	Evaluates the impact of AI on task efficiency by determining whether AI integration helped students complete their tasks more effectively
Motivation and Engagement	Question 5	How engaging were the tasks with AI assistance compared to those without AI?	Compares the motivational impact of AI-assisted tasks with traditional ones, helping to understand AI's role in enhancing student interest and participation
	Question 6	How did your confidence level in completing the tasks change when using AI compared to without AI?	Measures the impact of AI on students' confidence levels, providing insights into AI's potential to empower learners

The Interview

Categories	Question		Objective
Learning Outcomes	Question 7	Did you feel you learned more effectively from the tasks with AI support compared to the tasks without AI?	Assesses the effectiveness of AI in enhancing learning, providing valuable data on AI's impact on knowledge acquisition and retention.
	Question 8	Which language skill or skills (listening, speaking, reading and writing) did AI help you the most?	Identifies specific language skills benefited most by AI, informing targeted AI development and integration strategies
Comparison and Preferences	Question 9	Considering both learning experiences (with and without AI-assisted tools), which method did you find more beneficial to your learning?	Compares traditional methods with AI-enhanced learning methods, providing valuable insights into student preferences and perceived benefits
	Question 10	What improvements would you like to see in future flipped classroom activities, regardless of whether they involve AI or not?	Collects ideas for enhancing flipped classroom activities, with or without AI tools, and provides recommendations for future teaching methods
Open-Ended Questions	Question 11	After participating in this study, how could AI be further developed to improve the language learning experience?	Provides an opportunity for students to offer detailed feedback on AI's potential and limitations
	Question 12	Imagine you could design your ideal AI language learning tool for the flipped classroom. What features would it offer?	Encourages students to envision ideal AI-powered learning tools, providing a rich source of innovative ideas for future AI tools

By combining quantitative and qualitative data from these questions, the research aims to comprehensively evaluate the impact of AI on ESL learning within a flipped classroom context, identifying both benefits and drawbacks for future pedagogical and technological advancements.

Section 1: General Experience

1. How would you describe your overall experience with the flipped classroom activities?

Most participants in this study described the overall experience with the flipped classroom approach as very good (71.4%) or good (14.3%). A small number of participants considered it satisfactory. None of the participants had an unfavourable view after the experience at this point of the early stage of the interview.

Figure: 6. 1: Overall experience

2. Did you feel the difficulty level of the tasks changed when using AI compared to those without AI?

Regarding the difficulty level of the tasks with AI compared to those without AI, most students found AI helpful in performing the tasks, considering that 42.9% answered “easier with AI” and 14,3% answered “slightly easier with AI”. Conversely, 14.3% of the interviewees did not perceive any significant changes between the two experiments, probably due to time constraints as the experience lasted for four weeks, and there was not enough time to repeat the procedure.

Considering this is an initial approach with AI, the overall outcome of the experience has been considerably positive. However, there are areas to improve, such as providing further explanations and more support to those who struggle not only with AI but also have a low domain of ICT skills and improving the supporting structure of some structures and better time management of the activities given in class, including reducing the number of tasks.

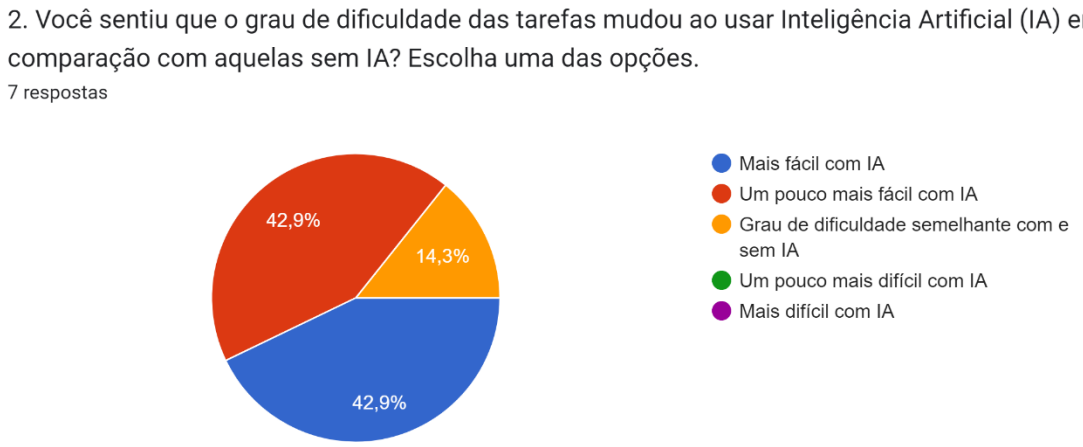

Figure: 6. 2: Level of difficulty with and without AI

Section 2: Learning Strategies

3. Did using AI in the second set of activities encourage you to try different learning strategies? (e.g., using new vocabulary apps)

During the experiment, 71.4% of the participants were more open to trying different learning strategies to assist them in learning English, which shows their willingness to embrace a more technological approach that was implemented to accelerate and revitalise the learning experience that for years was confined to grammar and vocabulary worksheets and reading and comprehension exercises.

Conversely, 28.6% of the students continued not to feel an urge to try other learning strategies besides those included in my classes.

Today's students spend more time on the Internet, have stronger ICT skills, and are more inclined to use technology in their studies. They find more enjoyment in learning strategies that favour more immediate feedback that is visually dynamic and resonates with them.

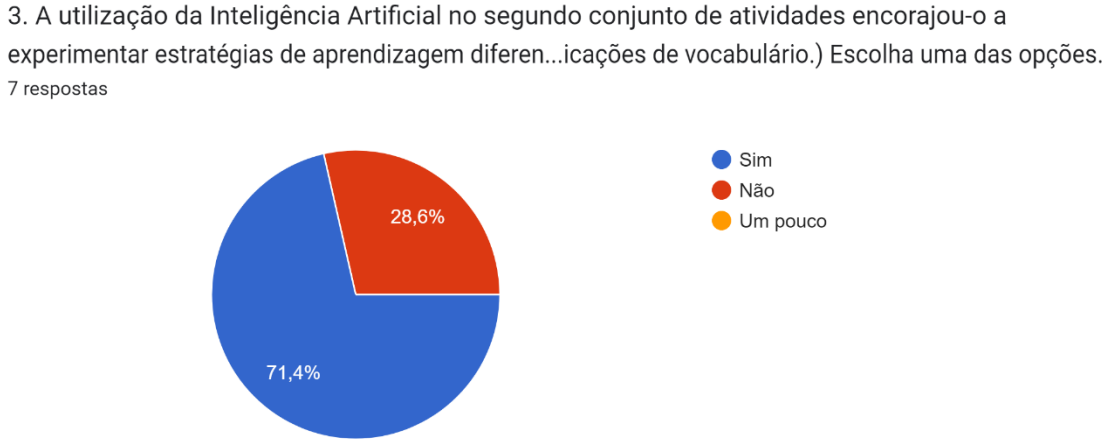

Figure: 6. 3: Did AI encourage students to try different learning strategies?

4. Did AI help you complete the tasks more efficiently?

Based on the pie chart, student opinions on AI's efficiency in task completion vary significantly. A majority (71.5%) indicated that AI is helpful, with 42.9% and 28.6% reporting "always" and "usually," respectively. Another 14.3% found AI helpful "sometimes." However, 14.3% of students did not perceive AI as beneficial, possibly due to unfamiliarity or discomfort with technology.

More assistance and further explanations in the classroom will help me decrease the percentage of reluctant learners who are unable to see AI's potential in their learning journey.

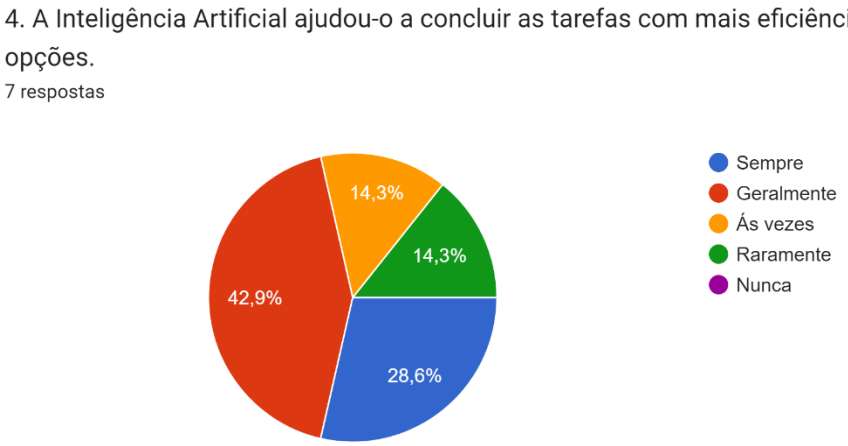

Figure: 6. 4: Did AI help students complete the tasks more efficiently?

Section 3: Motivation and Engagement

5. How engaging were the tasks with AI assistance compared to those without AI?

When it comes to engagement, 57.1% of the participants considered tasks with AI assistance significantly more engaging than those without AI. Additionally, 42.9% of the participants admitted that activities with AI were more engaging. Consequently, students in this group expressed that using AI tools enhanced the learning experience, highlighting a positive factor that may encourage sceptics to try it and gradually implement it.

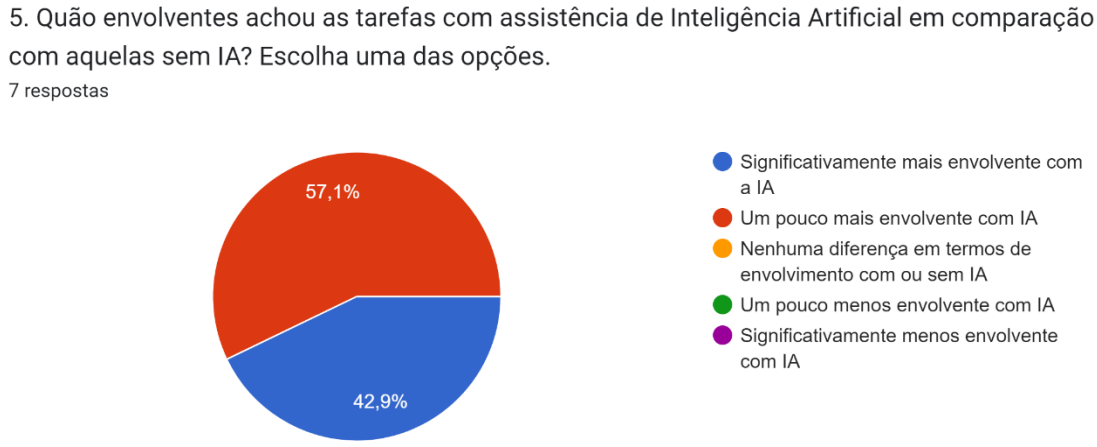

Figure: 6. 5: The level of engagement with and without AI

As learning strategies and methods naturally evolve and take new forms over time, teachers must embrace new trends that contribute to more dynamic, interactive, and appealing classes. Regular reflection on students' needs, motivations, and goals is crucial as today's students face different challenges, especially the ability to remain focused in a digital world full of distractions. Apart from that, raising their awareness about what they read, listen or watch on the Internet is necessary. It is paramount to question, look for evidence and support our findings before taking something for granted. Reliable and false information is at the push of a button. Hence, providing learners with tools and ethical practices is pertinent in order to prevent them from spreading fake, biased or distorted information.

In summary, AI and other emerging technologies can only benefit learners when tailored to students' abilities. All tools and strategies must be carefully explained to students

as they progress, avoiding overwhelming them with unnecessary details and providing support whenever needed. Showcasing the benefits of the technologies used throughout the learning journey is essential in keeping students motivated, curious, and comfortable.

Moreover, learning new skills can be highly demotivating when guidelines are poor, the purpose of tools is unclear, and students do not perceive tangible results, such as not feeling more confident or proficient as they move forward.

6. How did your confidence level in completing the tasks change when using AI compared to without AI?

Many students felt more confident when completing tasks with AI compared to those without AI. As the pie chart shows, 71.4% of the students in this experiment felt more confident with AI, while 14.3% reported no change in confidence. Further assistance should be provided in future English courses, as 14.3% claimed their confidence level remained the same. Fortunately, no students felt discouraged by using AI, which shows that students perceive the positive impact of AI in learning.

Figure: 6. 6: The level of confidence with and without AI

Based on my work experience and studies conducted in the field, confidence, among other human traits that influence and lead to success, effectively helps learners stay focused on accomplishing their goals despite all the trials and tribulations in language learning.

There is no learning without challenges or setbacks. Thus, it is vital to keep learners motivated, engaged, determined, and aware of their progress, as many students draw much negative attention to their difficulties and neglect to celebrate small victories as they evolve. Comparing oneself to those who learn faster and feeling behind contributes to a negative self-image that may lead to abandoning their fluency goals. On that account, teachers must be attentive not only to students' performance and results but also sensitive to any negative emotions that may arise, as these play an essential role in learners' progress and outcomes and must not be undervalued or disregarded.

Learning a foreign language or any other skill requires determination, consistency, and regular practice. Those who are naturally more confident tend to obtain more results in a shorter amount of time and, therefore, are less likely to give up before accomplishing the intended goal.

Section 4: Learning Outcomes

7. Did you feel you learned more effectively from the tasks with AI support compared to the tasks without AI?

After the experiment, 57.1% of the participants agreed that activities with AI assistance provided more helpful support for learning than those without it, followed by 28.6% that supported its use fully when voting on "strongly agree: AI significantly improved my learning experience". Only 14.3% manifested a neutral opinion by voting "neutral: I learned equally well with and without AI."

None of the experiment participants revealed negative feelings or total disbelief about the use of AI while conducting the study.

In conclusion, AI allows students to have quicker feedback, but it has limitations. Thanks to its features, learning can be adapted to suit the participants' needs and interests, making it an effective tool to be considered and used in the educational field.

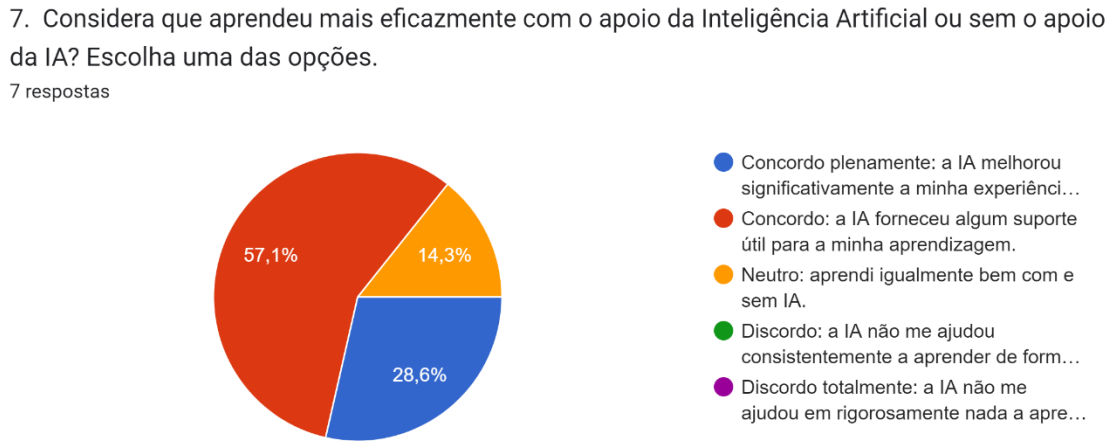

Figure: 6. 7: Learning pace with or without AI

8. Which language skill or skills (listening, speaking, reading and writing) did AI help you the most?

The following horizontal bar chart illustrates that participants considered AI more beneficial in reading tasks, with four votes out of seven participants (57.1%). There was also consensus on the effectiveness of AI-assisted tasks in activities involving speaking and writing (42.9%), both with three votes each.

It is also possible to verify that only a student (14.3%) reported that AI was more advantageous in developing listening competence. None of the students showed disbelief in AI's effectiveness in developing at least one of the four pillars of language: listening, speaking, reading, and writing.

Overall, the majority of students believed that AI could improve their reading ability in the first place, followed by their speaking and writing abilities. Based on the results, it is evident that new listening-oriented activities with AI must be implemented in the classroom, as they only helped one of the seven participants.

In the end, teachers cannot rely exclusively on formative and summative tests, as regular student opinion surveys are equally relevant in determining the quality of classes and taking the necessary measures to make them more meaningful, fruitful, and engaging.

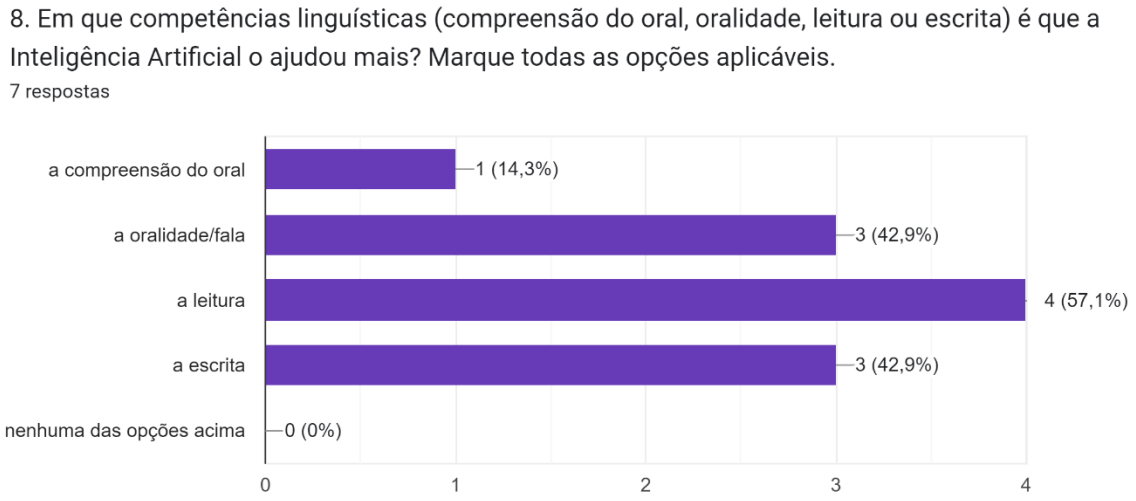

Figure: 6. 8: Which skill did AI help students the most?

Section 5: Comparison and Preferences

9. Considering both learning experiences (with and without AI-assisted tools), which method did you find more beneficial to your learning?

The pie chart data indicates that most students recognised the benefits of AI-assisted tools in their learning experience. 57.1% of students found AI-assisted tools helpful to some extent, and 42.9% considered using AI in teaching significantly more beneficial. Hence, this experiment shows that students noticed the advantages of using AI when learning English.

Overall, the data collected reveals that students favour using AI in the learning process, as it makes learning more engaging in today's digital world.

It is important to note that this view does not discredit traditional methods but highlights the importance of complementing them with emerging technological tools that have demonstrated their ability to enhance the learning process, making it more enjoyable, interactive, personalised, and effective.

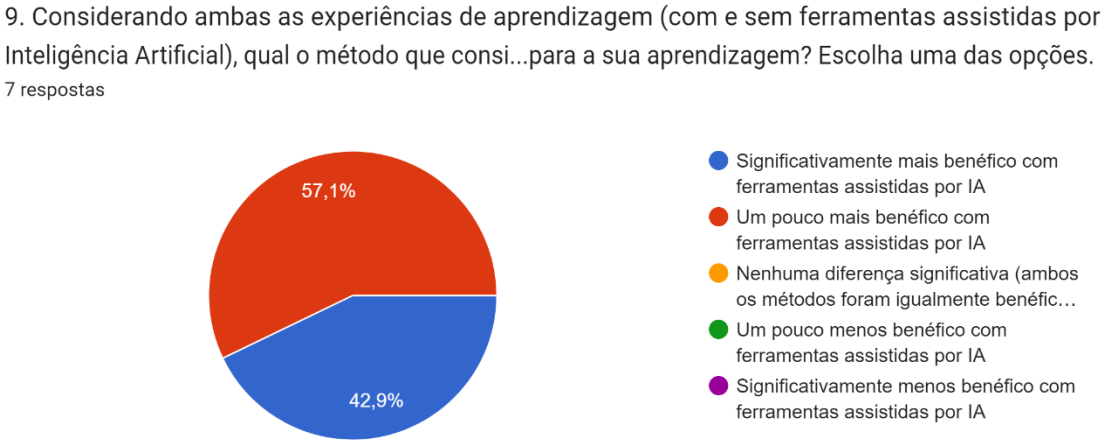

Figure: 6. 9: Students' perception of the most beneficial learning method

10. What improvements would you like to see in future flipped classroom activities, regardless of whether they involve AI or not?

In terms of improvements regarding the flipped classroom approach, students identified some areas for improvement, regardless of AI integration. Three key areas emerged, each selected by 42.9% of participants (note: participants could choose multiple options). Those adjustments included increasing AI-based and traditional interactive activities, providing more precise instructions and better task management and incorporating more collaborative learning opportunities such as group discussions, presentations, and pair work.

Additionally, one student, who represents 14.3%, expressed a desire for more self-paced and the need to create more personalised learning experiences.

In summary, the students in this group seek more interactive activities and straightforward guidelines. They also expect tasks to be readapted and are looking forward to self-paced and tailor-made activities, which can be challenging due to time constraints, different learning paces and extensive curricula in higher education or more advanced levels.

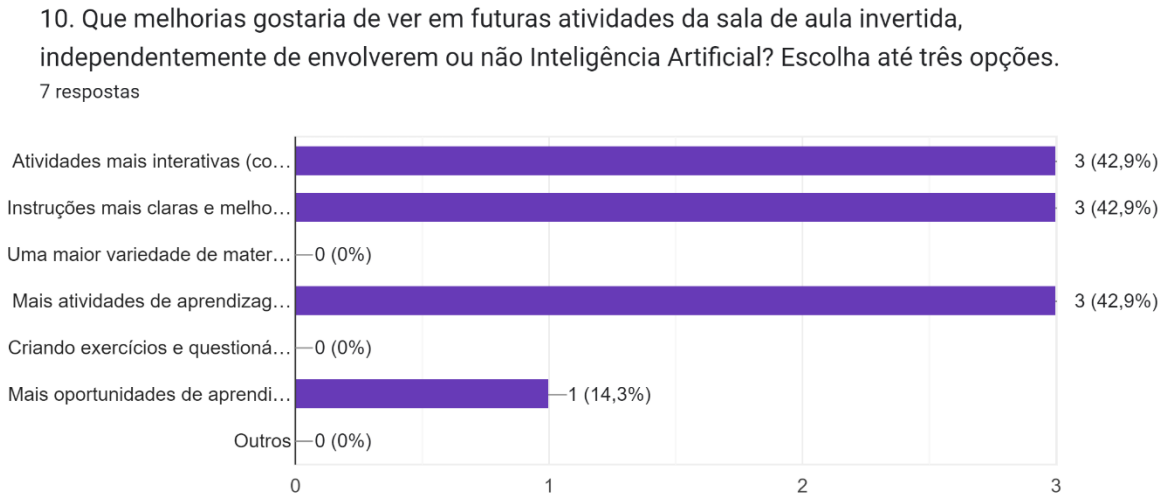

Figure: 6. 10: Improvements for the flipped classroom model

Section 6: Open-ended Questions

11. After participating in this study, how could AI be further developed to improve the language learning experience? You may write your answer in bullet points.

Two open-ended questions were strategically included in the last set of questions to delve deeper into the participants' expectations and needs. These open-ended responses bring research to life because they are more likely to include individual insights and each participant's real thoughts and feelings. In addition to trying to discover the learners' needs, challenges, and areas for progress, surveys should be put together in an interesting and meaningful way.

When asked how AI could be further developed to improve the language learning experience, participants stressed the need to enhance audio clarity and emphasised the importance of providing more individualised feedback.

Students commonly reported a lack of prior experience with AI tools, with one student feeling unable to provide specific improvement suggestions due to insufficient experience.

Most participants recognised the benefits of artificial intelligence as a learning tool, particularly for speaking, but still preferred in-person classes to facilitate discussions and expand questions. Also, a student found the current teaching method and strategies “very good” and expects further enhancements.

In conclusion, the feedback from the participants was positive and encouraging, emphasising the potential for AI to enhance their language skills. Even though technologies, including AI-powered tools, can enhance students' performance, engagement, and results, it is paramount to continue appreciating in-person interaction, and teachers' feedback remains crucial to students' success.

Answers:

1. At the moment I don't have enough experience to suggest any improvements.
2. Improve audio comprehension, e.g. I didn't always understand the intended words.
3. Artificial intelligence already helps significantly with learning, especially the oral part.
4. Give more accurate feedback.

5. For me, I prefer face-to-face classes, as I find it more beneficial to be able to discuss and answer questions.
6. For me, it's already very good, but any future improvements are welcome.

12. Imagine you could design your ideal AI language learning tool for the flipped classroom. What features would it offer? You may write your answer in bullet points.

In the final question, the second open-ended question of the interview, students described their ideal AI language learning tool for the flipped classroom approach, focusing on its essential features.

Many students suggested personalised learning tailored to individual needs (e.g., work, travel, reading, interacting with foreigners). They also recommended an AI with British and American pronunciation options for conversation practice, including automatic error correction.

One student expressed satisfaction with the current AI features, such as quick corrections, informative explanations, and easy access. Another student highlighted the potential of AI to facilitate conversations in daily life. However, one student suggested focusing on fewer topics and providing more support for specific difficulties instead of describing an ideal AI tool.

The students' perspectives in the interview show that an ideal AI language learning tool should be versatile and adaptable to meet the needs of learners with different learning styles and areas of difficulty. While some students emphasised personalised learning and diverse pronunciation options for real-life practice, others stressed the importance of a more targeted approach. Flexibility and adaptability are prerequisites when opting for AI language learning tools.

Answers:

1. So far, I am satisfied with the features I have found, such as quick corrections, both in pronunciation and writing, explanations on various topics in an enlightening way, easy access to AI platforms, so I have nothing to add.
2. Personalise the learning strategy according to each individual's interests or needs, e.g. for work, for travelling, for reading, for interacting with people of a different nationality...
3. An application with the option to choose the pronunciation (British/American) where we could hold a fluent conversation on a subject and each mistake would be corrected automatically.
4. AI is very advanced and helps us a lot in our daily lives.
5. At the moment, I don't have any suggestions in mind.
6. English classes that address fewer topics and provide further assistance in areas of difficulty would be more effective.

Based on the data provided in the interview, it is possible to infer that most participants benefitted from the experience that incorporated AI-powered tools in the flipped classroom approach. Most participants found the tasks with AI assistance more engaging, felt more confident, and learned more effectively when using AI when doing tasks compared to those without AI. Furthermore, the participants favoured a more technological approach, with many open to trying different learning strategies and finding AI helpful in completing tasks more rapidly and successfully. They also recognised that AI can enhance language learning, with a majority considering AI-assisted tools more beneficial to their learning than traditional methods.

Ultimately, despite a few ICT technical difficulties at the beginning of the experiment, most participants preferred AI-enhanced tools in the learning process, highlighting the importance of complementing traditional methods with emerging technological software and equipment. However, they also identified areas for improvement in future flipped classroom activities, including the need for more interactive and collaborative learning opportunities and more personalised and self-paced learning experiences.

Regarding open-ended questions, participants highlighted the need for AI language learning tools to offer features such as personalised learning, British and American English

pronunciation options, and quick error corrections. Also, they highlighted the importance of in-person interaction and teachers' feedback in the language learning experience.

In conclusion, thanks to the data collected, it is possible to conclude that students display a favourable attitude towards the potential of AI-powered tools to complement and accelerate language learning as long as they are created to meet students' abilities and are accompanied by traditional teaching methods. Undoubtedly, participants in the study provided inestimable insights based on their preferences, needs, and expectations regarding the integration of AI in the flipped classroom approach.

While AI is interactive and looks more refreshing for students, offering real-time and automatic feedback, it is crucial to identify and learn how to deal with potential limitations such as technical issues, privacy and ethical concerns, cultural sensitivity, the sometimes dubious, misleading and inaccurate quality of AI-Generated content and the risk of learners over relying on technology, leaving their own input behind. Future implementations should prioritise equitable access, ethical considerations, and a balanced approach that combines AI with traditional teaching methods to create the most effective learning environment that requires both. Handwriting and critical thinking ability are two of the fundamental learning strategies that have been around since the dawn of time and ensure proper and reliable language learning.

Reflection on Findings

In today's education, artificial intelligence plays a pivotal role in reshaping the concept of language learning. Emerging technologies, particularly AI-based ones, are redesigning the scope of language instruction, presenting both exciting opportunities and challenges for educators.

Keeping up with the ever-changing nature of AI and its constant upgrades can be overwhelming for educators. AI uses metrics and algorithms to make language learning more personalised and engaging, providing real-time feedback in some cases. Language learning tools, including mobile applications and websites, are here to stay since they were designed to help students learn languages more autonomously, rapidly, and efficiently. As a matter of fact, these innovative tools can provide students with adaptive learning experiences and make learning more enjoyable and interactive.

Undoubtedly, technology and the internet have significantly altered the way we define language teaching in the past two decades, offering numerous benefits for teachers and students. Thanks to technology, teachers can now create more engaging and interactive lessons that cater to their students' diverse needs, inspiring them to be more creative and motivated in their teaching. Technology has opened up new opportunities for language learners to practise their skills in real-world contexts, from online video conferencing to virtual reality. Therefore, technology and the internet have become increasingly crucial for successful language teaching in the 21st century.

Notwithstanding, materials, resources and tools can only be helpful when teachers integrate them in activities that were thoroughly planned and sculpted with the students' needs, difficulties and objectives in mind.

First and foremost, the approach, objectives, and strategies to be used in the classroom setting should be the top priority of a teacher. Taking that into account, choosing a reliable and successful approach is the first step, as it can enhance or hinder the quality and dynamism of the class, which obviously affects the students' motivation, interest, and learning outcomes. Student-centred and goal-oriented approaches have always caught my eye among the plethora of instructional approaches and methods.

Before choosing the right approach or method for students, it is vital to consider their ages, level of English, difficulties, needs, motivations and objectives. The “right” is probably a limiting word that may not convey the intended idea. The point here is to show that some

approaches can be more effective than others, depending on the students' backgrounds, characteristics, and proficiency level.

One of my favourite teaching approaches is the flipped classroom due to its practicable and dynamic nature. This teaching model has redefined the traditional classroom dynamics, placing students at the centre of the learning process. They are no longer passive recipients of knowledge but active participants, instructed to seek and explore learning materials before class. This proactive approach not only prepares them for the upcoming material but also deepens their understanding of previous topics. Class time is then dedicated to more active and collaborative tasks, such as group assignments or problem-solving discussions, where students can apply their knowledge and skills.

In the flipped classroom, learners are given access to instructional material before class, usually through video lectures or readings. Class time is then used for activities that allow learners to apply and practice the material they have already studied and analysed at home. This model has several advantages, including increased learner autonomy and engagement, and it may provide more opportunities for peer-to-peer collaboration and feedback.

According to cofounder of the Flipped Learning Network, Kari M. Arfstrom (2014), the key of flipped learning is to provide opportunities for active interaction. She describes it as "a pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter." The flipped classroom model enables students to learn at their own pace outside the classroom, releasing precious time for in-class collaboration or deepening their understanding of the materials studied at home. By shifting the focus of classroom time to active learning activities, teachers can design more dynamic and practical classes.

To maximise learning, especially when teaching beginners, it is of utmost importance to guide students by the hand with the Presentation, Practice and Production teaching method, also known as PPP. This method is widely used in teaching simple language at lower levels. Yet teachers cannot rely exclusively upon that teaching method as it has some perilous limitations.

Firstly, PPP can be repetitive and tedious for students at times. It may focus too much on accuracy and not enough on fluency or creativity. Secondly, it can be too teacher-centred and not allow for enough student input or interaction. Thirdly, PPP may not adequately prepare students for real-life communication, as it does not necessarily reflect the unpredictability and variety of language use outside the classroom.

Some educators may argue that the PPP method is outdated and ineffective for language learning as it is primarily focused on grammar and fails to promote genuine language use, leaving little time for real language production - either oral or written. Hence, many educators argue that a more communicative approach, such as task-based learning, is preferable to foster effective language acquisition. By focusing on meaning and a more realistic language use, learners can indeed develop their language skills in a more meaningful and engaging way.

Apart from PPP, which tends to be teacher-centred when misused, other teaching approaches should be considered. It is advisable and beneficial to combine or, at least, consider other adequate approaches for adult learners who have just started a foreign language, including the Communicative Approach, the Task-Based Language Teaching Approach, and the Lexical Approach.

The Communicative Approach relies on the use of language in real-life situations and aims to develop learners' ability to communicate effectively. In this approach, teachers use authentic materials and encourage learners to communicate meaningfully with others.

The Task-Based Language Teaching Approach (TBLT) focuses on completing tasks to learn a language. In TBLT, learners may work together to solve problems and complete tasks that require the use of language.

The Lexical Approach focuses on learning vocabulary and collocations to foster language learning. In this approach, learners focus on the words and phrases commonly used together in the target language rather than on individual words or grammar rules.

Needless to say, language teachers need to be aware of its limitations and incorporate various teaching methods to better meet the needs and goals of their students.

Pedagogy can provide opportunities and conditions that can positively affect learning (Breen, 2001; Arnold, 1999). Successful learners have some characteristics in common: they have developed insightful and positive beliefs about language learning, are resilient, engage

in activities, and prefer seeking solutions rather than focusing on the difficulties that any language presents, which facilitates the learning process. It is hard to pin down the psychological mechanisms involved in creating, shaping and guiding those beliefs, which are triggered by internal and external factors.

The use of Artificial Intelligence (AI) tools, particularly chatbots, is expected to enhance teaching and learning. These technologies accelerate the learning process and enhance students' confidence by offering immediate access to information and assistance, resulting in a more independent and adaptable learning environment. It has never been this easy to have a tutor at our disposal. However, as we all know or should be aware, it comes with certain limitations and is dangerous, mainly when students use AI tools to do all the creative work for themselves. This lack of common sense will come with a price, as they are unlikely to reach fluency in English or any other language if all their effort lies in typing or telling prompts.

AI is no longer just a technological or computational area, in the opinion of many individuals (Southworth et al., 2023). Teaching technical skills is no longer the only aspect of AI literacy; a wide range of topics are now covered. A set of AI skills, for example, is outlined by Long and Magerko (2020) and addresses basic questions concerning AI, such as what AI is, what it can accomplish, how it functions, how it should be utilised, and how people perceive it. The competencies outlined in their framework are necessary for people to critically assess AI technology, interact and communicate with AI systems efficiently, and use AI as a helpful instrument in various settings, such as the workplace, home, and classroom.

Many countries, including the United States of America and China, have already started to incorporate AI into their primary and secondary education curricula (Cantú-Ortiz et al., 2020; Lee et al., 2021). For instance, the Ministry of Education in China formally incorporated AI into the curriculum in 2018, and the first AI textbooks were published in the same year (Su et al., 2023).

Shortly afterwards, the European Union, Japan, South Korea, Singapore, and other places began considering AI in education. In this regard, UNESCO has actively promoted conversations about implementing AI in education (UNESCO, 2023). In the meantime, new AI curriculum documents are being proposed (Touretzky et al., 2019). Those documents include a variety of subjects, such as conversational agents (Van Brummelen, 2019),

machine learning (Jiang et al., 2023; Marques et al., 2020; Wan et al., 2020), ethics (Ali et al., 2019), and so forth.

It is now possible to see that this interaction between AI systems and students (Long et al., 2023) helps them engage both in practical activities and experience-based learning (Su & Ng, 2023; Williams et al., 2023). This way, learners can apply AI techniques to real-life problems, which contributes to learning technical skills and boosts their critical thinking, problem-solving, and teamwork skills, which are equally paramount to the AI sphere (Southworth et al., 2023). Undoubtedly, teaching AI literacy allows students to be aware of ethical issues and think critically about the impact of AI in modern societies (Laupichler et al., 2023).

Considering today's fast-paced world, testing and renewing perspectives and approaches is fundamental, not only in the educational field. It is nearly impossible to escape or neglect AI in our lives, as it is spreading and gaining space whether we like it or not. Inevitably, educators need support and training to benefit from AI thoroughly before integrating AI literacy into current subjects. This integration should be seen as a step forward in formal education. However, many schools are still falling behind because more support is needed for teachers to teach AI literacy using interdisciplinary, project-based approaches with suitable technologies (Ng et al., 2023).

After the experiment and feedback obtained through the final interview that marked the end of the experiment, it was possible to conclude that AI, when moderately used and integrated into a well-designed and planned curriculum, can indeed improve learning experiences in schools (Huang et al., 2019) by enhancing students' intellectual performance and abilities.

Chen et al. (2023, p. 3) claims that "when deployed to support learning, AI technologies may augment human capability in performing the task, while also enabling humans to learn from the AI-supported experience."

Today's generative AI chatbots, such as ChatGPT, Google's Gemini, Microsoft's Copilot or Claude AI, to name a few, can embody different roles, including a personal tutor that gives instant feedback, an assistant that helps students in questioning and reflecting upon their learning progress, an engine that generates alternative ideas, for instance (UNESCO, 2023).

One the one hand, chatbots can interact with users at any time, leading to increased user satisfaction (Winkler & Söllner, 2018), making chatbots valuable tools for L2 learning beyond the traditional classroom, typically teacher-centred. On the other hand, chatbots have limitations, particularly in handling non-linear conversations that require referencing and integrating previous topics (Grudin & Jacques, 2019).

Even though chatbots may not be perfect language tutors, Fryer and Carpenter (2006) point out some benefits teachers and scholars should consider in L2 teaching. Today's chatbots can contribute to L2 learning due to their mind-blowing and yet-in-development broad range of abilities to:

- Encourage learners to practice reading through text reading;
- Introduce learners to new words and phrases that they may not encounter in traditional classroom settings, expanding their vocabulary and making their language more natural and expressive;
- Offer a fun and dynamic way to learn a language, making it more interesting, engaging and motivating for students;
- Provide a safer, supportive and friendlier environment where learners practice their language skills without fear of judgment or embarrassment. This feature is particularly beneficial for shy or anxious learners.
- Engage in long conversations with learners, providing ample opportunities to practise their language skills and receive immediate and tailored feedback.
- Quickly identify and correct language errors, helping learners improve their accuracy and thus make fewer mistakes.

In today's education, an important aspect to ponder is how we will navigate a human-AI relationship that genuinely enriches and empowers our students. For instance, letting students reflect on their relationships with these chatbots becomes simultaneously relevant and necessary to create a climate of trust between educators and students and ensure proper and responsible use of AI in their school work.

Generative AI systems herald a new era of "assisted creativity", where AI becomes a collaborative agent for various creative endeavours (Vinchon et al., 2023). Hence, establishing clear agency boundaries between individuals, collectives, and AI is crucial for thriving in an AI-mediated environment (Bearman & Ajjawi, 2023; Markauskaite et al.,

2022). Therefore, it is imperative to encourage students to reflect on their use of AI tools to foster AI literacy as a natural outcome of AI-enhanced learning. Introducing Generative Artificial Intelligence, also known as GenAI, in classrooms has the potential to enhance student knowledge building as it offers a unique opportunity to achieve two important goals: first, to use AI to support students' creative and problem-solving abilities, and second, to help them reach a deeper understanding of AI, including its advantages, limitations and pitfalls to avoid.

Findings in the use of AI in the flipped classroom approach revealed that language learners generally held a positive emotional stance and demonstrated a higher level of enjoyment throughout the interaction with AI tools.

Long (1996) argues that interaction in the target language is crucial for second language acquisition. Communicating with chatbots in written or spoken formats can effectively facilitate language learning. Consequently, this interaction may take various forms, including dialogue with computer-assisted language learning (CALL) systems like chatbots (Chapelle, 2005).

When interacting with chatbots, learners can engage in three key processes that promote language development: focusing on linguistic form, receiving modified input, and negotiating meaning (Chapelle, 2005). These processes help learners become more aware of their linguistic knowledge gaps and improve their understanding of the relationship between language form and meaning.

It is undeniable that AI is revolutionising language teaching by providing personalised feedback and a significant number of possibilities to enhance students' outcomes and engagement. Although these tools can improve student motivation, engagement, overall performance and outcomes, we, teachers, must carefully consider and address the possible drawbacks, such as plagiarism and overreliance on AI.

Conclusion

1. Overview

This research investigated the impact of Artificial Intelligence (AI) on language learning in a flipped classroom setting. Through an initial questionnaire, a controlled experiment, and interviews, the study evaluated whether AI positively influenced language learners' performance while exploring the factors affecting the outcomes. The findings revealed valuable insights into the potential benefits and limitations of integrating AI into language teaching practices, particularly when combined with a flipped classroom approach.

Succinctly, the flipped classroom model is a "pedagogical approach in which direct instruction moves from the group learning space to the individual learning space, and the resulting group space is transformed into a dynamic, interactive learning environment where the educator guides students as they apply concepts and engage creatively in the subject matter (FLN, 2014)". This way, teachers can gradually introduce new or different techniques into their classrooms by transitioning from a traditional, teacher-centred class to a more engaging and stimulating class where participating students actively learn and seek knowledge priorly. This shift liberates classroom time for more one-on-one and small-group instruction, and since students are expected to prepare themselves for the upcoming class, most teachers can only praise it. When students roll up their sleeves, actively participate and deliberately take action, they acquire knowledge faster and achieve better results.

In today's ever-changing world, AI-powered solutions can help learners acquire a second language faster and more naturally by offering tailored practice, simulating conversations, real-time feedback, 24/7 accessibility, and additional motivation. While classroom participation is still crucial, AI might complement traditional teaching approaches to deliver more effective and engaging learning experiences.

Nowadays, a great number of students already use popular chatbots such as ChatGPT, Gemini or Microsoft Copilot to help them write, paraphrase and summarise texts, and even answer questions, but do they know what chatbots are? Basic chatbots are programmed to handle specific tasks and respond with pre-programmed answers. They are limited in understanding and responding to questions outside of their pre-programmed answers. In contrast, conversational AI systems can understand and respond to human language in a more sophisticated way (Ahmed, 2014).

Conclusion

Based on the initial questionnaire, it is possible to conclude that most students attending this course decided to attend it for work or personal development reasons. All respondents think technology can help them learn a language, but only 40 per cent had used artificial intelligence tools up to that point. From the outset, most students felt comfortable or very comfortable using AI for educational purposes, with only 10 per cent feeling relatively comfortable. Regarding curiosity about using AI in English teaching, 40 per cent of the participants were curious, 20 per cent very curious, and only 10 per cent showed little interest. This data supports my belief that AI can indeed contribute to learning English, accelerating the learning process and making it more appealing.

Regarding learning strategies, students prefer to use apps, watch films or series, listen to music, and enjoy doing more traditional grammar and vocabulary exercises in exercise books.

Unfortunately, not all students have a consistent study routine. The two biggest challenges in their learning journey are the fear of making mistakes and the lack of consistency. Around 60% of respondents study every other day or three to four times a week. However, there is a unanimous response regarding the importance of personalised feedback during English language learning. Therefore, students consider feedback very important (40%) or important (60%) and think it should preferably be more individualised and adapted to each learner's needs and goals. In this respect, AI is able to help teachers and students, given its ability to provide instant feedback. However, it is fundamental to note that AI tools are not always reliable and do not have the same level of proximity to students as human teachers or tutors. This means they are not fully aware of one's general progress or emotional state while performing their tasks, which limits their effectiveness and credibility. At this stage, students believe that AI tools can provide helpful feedback on their tasks, but it is also essential to help them identify AI’s limitations.

Having the flipped classroom as a teaching approach, known by 80 per cent of the students and which 70 per cent consider very effective and 30 per cent effective, supports my belief in its effectiveness in teaching English to adults. In addition, students claim that the main advantages of this approach are the possibility of greater participation in lessons and a deeper understanding of the content and the promotion of their autonomy as learners, making them more active than passive because one genuinely learns by actively doing, not just by listening or reading. However, only 60 per cent of those surveyed felt at least

comfortable with independent study outside the classroom context, which aims to prepare students for the next lesson. This suggests that new strategies should be implemented so students feel more motivated and accompanied in their independent study. The lack of motivation to complete tasks is undoubtedly one of their primary concerns. To avoid this demotivation, AI plays a vital role, as it can make the learning experience more dynamic and desirable through the creation of interactive dialogue simulations, the possibility of chatting with virtual tutors and the creation of personalised exercises and quizzes based on the student's needs and objectives. Thanks to AI assistance, students can improve their language skills, particularly their oral and written skills. Based on the responses collected in an online questionnaire, students consider the use of AI tools to be an asset to their learning, as it can boost language learning, making it more interactive and appealing as well as providing more immediate feedback to students, which contributes to more motivating, faster and autonomous learning.

When it comes to the experiment, participants favoured the activities that involved AI and considered them more engaging and beneficial to their learning. Even though AI-supported activities have proven to be fruitful, traditional activities such as note-taking in class, reading and listening tasks with multiple-choice quizzes, or gap-filling exercises should not be disregarded entirely, as they still provide valuable support to today's more technology-oriented classes. It all comes down to finding the perfect balance between the two teaching approaches. This balance should consider students' needs, goals, and motivation and help them develop sound and consistent study habits beyond the classroom setting. Additionally, teachers must monitor their students' progress and make it noticeable to them, as they are less likely to abandon their language learning goal when they notice steady progress. At the same time, teachers must find ways to simultaneously nurture their students' motivation and help them overcome their fears and insecurities, such as being excessively self-critical. Teachers should also prevent learning difficulties from piling up, such as pronunciation struggles and forming sentences. This includes teaching students how to naturally place words in sentences and use tenses correctly to express their ideas in the past, present, and future. However, it is essential to note that integrating AI-supported activities into the classroom may present challenges such as technical issues, student resistance, or the need for additional training. By carefully considering the benefits and

limitations of both traditional and technological methods, educators can create a learning environment that empowers students to reach their full potential.

After the experiment, participants took part in an interview in order to reflect on the learning experience with and without AI-powered tools. The findings were unsurprising, as I had carefully planned and studied the benefits, limitations, and pitfalls of using AI in adult language teaching beforehand.

Regarding the overall experience, 71.4% described it as very good, 14.3% as good, and 14.3% as satisfactory. None of the students regarded it as unsatisfactory or poor. In fact, 42.9% claimed that the activities with AI facilitated their learning. 42.9% stated that AI made it slightly easier, compared to 14.3% who felt the same difficulties doing the activities with or without AI.

When it comes to learning strategies, 71.4% of the students believe that the second set of activities with AI-assisted tools encouraged them to try different learning strategies, such as using new vocabulary apps. Most students then claimed that AI helped them conclude the tasks more efficiently than those without AI. 28.6% of the students felt that AI always helped them, and 28.6% felt generally helped by AI.

In terms of motivation and interaction, all participants considered tasks with AI assistance to be more engaging than those without AI, and 71.4% noted that they felt slightly more confident when using AI.

Results usually speak for themselves. All students once again agreed that AI provided some helpful support for their learning and thus learned more effectively from the tasks with AI support. The language skills that AI helped them with the most were reading, speaking, and writing. Based on the data collected, students felt that AI did not provide the necessary assistance in the listening activities.

Considering both learning experiences with and without AI-assisted tools, 57.1% said that the experiment was somewhat more beneficial with AI-assisted tools, and 42.9% claimed that it was significantly more beneficial with AI-assisted tools. In the future, these language learners seek more interactive activities both with and without AI, clearer instructions, better task management, and more collaborative learning activities such as group discussions, presentations, pair work, and brainstorming activities.

Finally, two open-ended questions were added to allow students to comment on how AI can be further developed to improve the language learning experience. Participants were

also asked to imagine and mention the features of an AI learning tool to integrate into the flipped classroom approach to enhance the quality and effectiveness of classes. Among the improvements to consider, participants suggested more listening activities, more feedback on their British and American English pronunciation, and more personalised activities based on students' genuine needs and interests.

While some students value personalised learning and exposure to different accents, others prefer a more focused approach. Hence, AI tools must be adaptable to meet learners' goals, expectations, and needs. Ultimately, this is a difficult milestone to achieve, especially when teaching larger groups of students. Yet, it is still feasible to some extent.

In essence, AI-based learning and traditional approaches offer both advantages and disadvantages. On the one hand, conventional techniques foster a closer human relationship and a gradual understanding between students and teachers. Still, traditional approaches may be limited in resources that may not keep most students motivated and engaged in the long run. Another negative aspect is not offering constant individualised attention in the classroom or at home, which students with greater difficulties need. On the other hand, using AI in learning allows more customised experiences, immediate feedback, and flexibility, which is likely to help and motivate students with different learning styles or moderate learning disabilities. Also, AI tools are more easily adapted to meet individual expectations and goals. However, reliance on technology may result in a loss of human interaction and emotional connection, threaten critical and problem-solving abilities, and leave a climate of mistrust between educators and learners.

In this research study, as I initially thought, students preferred and achieved better results when using AI, which is not to prove that traditional methods are doomed to oblivion or that they are totally ineffective or obsolete. A balanced strategy that blends the strengths of AI with the equally stronger traits of conventional methods, such as teamwork or in-class debates, can enrich the language learning experience.

The experiment highlights the importance of integrating AI-supported tools into adult English language teaching. While traditional methods are still applicable and relevant, AI-powered tools can help teachers create more engaging and creative classes and offer feedback to students in seconds, inevitably reducing our workload.

Conclusion

From where I stand, AI, as an adaptable tool, is not meant to replace human teaching but to create more interactive, captivating, and customized learning scenarios. Inevitably, it is crucial to approach AI critically and understand its limitations and potential biases. This shift towards student-centred learning has numerous benefits, including a stronger trust and closeness between teachers and students. The adaptability of AI empowers educators to be more flexible and responsive to their students' needs, leading to more motivated and participative students.

Lastly, today's language teachers must reassess their perspectives and do their best to observe the positive aspects of integrating AI into education. Embracing AI should not be seen as one's personal choice or whim but as a necessity in the ever-evolving educational landscape. This adaptability indicates a relentless commitment to providing students with the finest and latest learning experiences. By taking a proactive approach and having an open mindset, language teachers can harness the power of AI to create outstanding classes that are simultaneously entertaining and efficient while ensuring the profession's continuing relevance.

2. Pedagogical implications of the study

Beyond all available teaching approaches, cutting-edge strategies, and educational tools, teachers must address the diverse needs of language learners, considering their age, learning styles, preferences, motivations, cultural backgrounds, and learning environments.

While acknowledging the potential benefits of artificial intelligence, including the use of chatbots in education, this study underscores the importance of creating authentic opportunities for students to interact with AI. For instance, students can engage in language learning conversations with AI chatbots, participate in AI-powered language games, or use AI language tutors for personalised learning. This integration not only develops their AI literacy but also sparks their interest in learning, whether individually or in a group. The integration of AI tools can leverage knowledge-building and accelerate understanding. Additionally, it is fundamental to acknowledge the need for further research to explore the impact of student-AI partnerships on the learning process, as they negatively influence students when they merely rely on AI. This dependency impedes their learning and does not

contribute to realistic learning outcomes as they lose their creativity and problem-solving abilities.

It is no longer possible to ignore the presence of AI in today's education. However, educators willing to adapt and learn to use AI in teaching will not fall behind. Instead, they will become more relevant and capable in the teaching field. Additionally, AI can enhance student motivation, interest, and results when used in moderation and responsibly.

Based on the experiment, it is crystal clear that most students prefer activities with AI to traditional ones that heavily rely on worksheets, PowerPoint presentations, and coursebooks. In today's digital world, learners prefer more dynamic, visual, and entertaining methods. AI plays a crucial role in creating a more engaging learning environment, fostering a stronger connection between educators and their students.

Some of the benefits of AI-powered tools are personalised practice, instant feedback, and self-paced learning. Moreover, chatbots can emulate language usage in the real world for beneficial practice and improve learner confidence and, consequently, one's performance. AI has been shown to increase language proficiency, particularly in vocabulary attainment and speaking skills.

Before using AI tools, learners may have varying levels of comfort with technology and different learning preferences. However, after experiencing AI-enhanced learning, many learners report increased confidence in using technology and a positive perception of its effectiveness.

While AI tools offer numerous advantages, being aware of their limitations is crucial. Educators should remember that they are in control. In some instances, AI may not fully comprehend the subtleties of complex language, and obviously, it cannot replicate human interaction entirely. Moreover, it is fundamental to validate the answers generated by AI. This control ensures that educators can use AI to its full potential while maintaining the integrity of their teaching.

Nevertheless, AI brings a multitude of benefits to both teachers and students. Educators can now harness various AI tools to reduce their workload, plan personalised instruction, and better understand their students' progress. AI-based tools also offer students personalised and interactive learning experiences, empowering educators to provide a more tailored and effective learning environment.

By carefully considering the advantages, limitations and concerns regarding the use of AI in the teaching sphere, educators can design more effective, memorable and engaging learning experiences for their students.

Emotional factors such as stress management, motivation, and confidence should also be considered in teaching, as they play a critical role in language learning and production.

Although technology cannot be neglected or underestimated these days, emotion alongside teaching approaches such as the task-based approach, communicative approach, and lexical approach, among others, help language learners explore and slowly climb the proficiency ladder. There are no shortcuts to success, which also applies to effective language learning. Peer work and teacher guidance are also key in the process.

3. Limitations of the study

Despite time constraints and the demanding nature of the experiment, I successfully guided, monitored, and motivated the experimental group. Unfortunately, not everything went according to the earlier plan. One setback was the sample size, as only seven of the ten initial students completed the experiment and final interview. However, these limitations did not diminish the value of the insights gained.

Undoubtedly, a larger student group and a more extended timeframe would significantly enhance the experiment's reliability and validity.

An ideal scenario would involve a longer timeframe, allocating two weeks for each language skill: one for a traditional approach and another with AI tools, namely chatbots.

Regrettably, the experiment did not include a control group, as there were only two distinctive groups at that time: one at the A1 level of English (beginners) and another with a higher level of proficiency (A2 pre-intermediate).

Another limitation was the limited time to take notes in classroom observations.

Most students were satisfied with the chatbot's language quality and conversational prowess. While pedagogical chatbots are promising in L2 education (Coniam, 2014; Fryer & Carpenter, 2006; Gallacher et al., 2018; Kwon et al., 2023), they also display limitations. These include their inability to engage in extended conversations, sensitivity to inaccurate language forms, and occasional irrelevant responses (Gallacher et al., 2018; Grudin &

Jacques, 2019; Smutny & Schreiberova, 2020; Thompson et al., 2018). As a result, they still fall short of providing learners with the most exquisite and trustable L2 learning experience at this point.

However, in retrospect, this experiment with AI involving the four pillars of a language was a great success. The students' enthusiasm, engagement, and tangible results are living proof. With more time to plan, further research and more testing, AI can be both a teacher's and a student's best ally.

In the world of AI, there two major technologies at play and that should be distinguished: chatbots and AI agents. “Chatbots follow scripted conversation workflows that need to be built manually, while AI Agents use generative AI, large language models (LLMs) and natural language processing (NLP) to understand, respond and action customer queries” (Oyston).

According to Alrajhi (2024), educators should integrate chatbots thoughtfully into their teaching practices as they offer potential benefits for language learning.

In conclusion, it is important to design tasks that maintain student motivation and interest. We can gradually refine second language learning in the digital age by combining effective teaching strategies and reputable teaching approaches, such as the flipped classroom approach, with ongoing research in chatbot technology.

There is still a long way to go, considering that new trends and features appear as we speak. That is why consistent research and a good dose of curiosity are crucial for language teachers and researchers. This ongoing research will help us further develop our teaching strategies and methods, ensuring we do not fall behind and can keep up with the times. As a teacher, I am committed to studying and researching how AI can positively impact language learners in the classroom and beyond. In the future, I intend to pursue my studies in language and technology, as I genuinely believe they enhance language learning. However, considering the hindrances and limitations of AI, such as potential biases and ethical concerns, is crucial.

There is no turning back from the advancement of AI. Therefore, fearing or disregarding it is counterproductive. On the contrary, adapting and using technology to our advantage is the most prudent decision. This represents a natural evolution, a necessary step in keeping pace with today’s world, where progress and technology go hand in hand.

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Appendixes

Initial Questionnaire Findings: Questions and Answers (in English)

Here are the questions and options for each section of the initial multiple-choice questionnaire.

Section 1: Beliefs, background and expectations (5 questions)

1. What is your age range? Choose one of the options

☐ 18 – 24

☐ 25 – 34

☐ 35 – 44

☐ 45 – 54

☐ + 55

2. What is/are your primary reason(s) for learning English? Select all that apply.

☐ For work purposes

☐ For studying abroad

☐ For personal development

☐ For making foreign friends

☐ Other

3. How would you describe your current foreign language learning experience? Choose one of the options.

☐ Effective and enjoyable

☐ Moderately challenging but rewarding

☐ Frustrating and slow-moving

☐ I have not learned a foreign language before.

4. Technology plays a significant role in language acquisition. To what extent do you agree with the previous statement? Choose one of the options.

☐ Strongly agree

☐ Agree

☐ Neutral

☐ Disagree

☐ Strongly disagree

5. Have you ever used any AI-powered language learning tools before? Choose one of the options.

☐ Yes, I have.

☐ No, I have not.

☐ I am not sure what AI-powered tools are.

Section 2: Learning strategies (5 questions)

1. Which of the following learning strategies do you typically use to learn or improve your English? Select all that apply.

☐ Using flashcards

☐ Using language learning apps

☐ Watching films, series, TV shows or YouTube videos in English

☐ Reading books, articles or the news in English

☐ Listening to music in the English

☐ Talking with native speakers whenever possible

☐ Doing grammar and vocabulary exercises on workbooks

☐ Other

2. How often do you usually study English (beyond the classroom setting)? Choose one of the options.

☐ Daily

☐ Every other day

☐ Three to four times a week

☐ Twice a week

☐ Once a week

☐ I never study at home.

3. How important is personalised feedback in learning English? Choose one of the options.

☐ Very important

☐ Important

☐ Fairly important

☐ Slightly important

☐ Not important

4. In your opinion, what are the biggest challenges adult learners face when learning English? Select all that apply.

☐ Lack of time

☐ Lack of consistency

☐ Feeling discouraged by mistakes

☐ Struggling with grammar rules

☐ Not having a clear study method and objectives

☐ Limited access to native speakers

☐ Other

5. How comfortable do you feel using technology for learning purposes? Choose one of the options.

☐ Very comfortable

☐ Comfortable

☐ Slightly comfortable

☐ Little uncomfortable

☐ Totally uncomfortable

Section 3: Flipped classroom model (5 questions)

1. Are you familiar with the flipped classroom approach in language learning?
Choose one of the options.

☐ Yes, I am.

☐ No, I am not.

☐ I am unsure.

2. How effective is the flipped classroom approach (which involves pre-class learning and in-class practice)? Choose one of the options.

☐ Very effective

☐ Effective

☐ Somewhat

☐ Not effective

☐ I do not have an opinion on this matter.

3. How comfortable are you with independently acquiring knowledge before attending the next class? Choose one of the options.

☐ Very comfortable

☐ Comfortable

☐ Slightly comfortable

☐ Little uncomfortable

☐ Totally uncomfortable

4. In your opinion, what are the main benefits of the flipped classroom approach? Select all that apply.

☐ Improved in-class participation

☐ Deeper understanding of the topics

☐ More time for practising speaking skills

☐ Increased student autonomy

☐ Faster results

☐ Other

☐ None of the above

5. What are your concerns, if any, about the flipped classroom approach? (Select all that apply.)

☐ Difficulty understanding pre-class materials

☐ Lack of motivation to complete pre-class work

☐ Feeling unprepared for in-class discussions

☐ Feeling overwhelmed or under pressure

☐ Other

☐ None of the above

Section 4: AI and the Flipped Classroom Approach - Conclusion (6 questions)

1. How curious are you on how AI tools can be used in language learning? Choose one of the options.

☐ Very curious

☐ Curious

☐ Somewhat curious

☐ Little curious

☐ Not particularly curious

2. How important is it to you that your language learning experience is tailored to your individual needs and goals? Choose one of the options.

☐ Very important

☐ Important

☐ Somewhat important

☐ A little important

☐ Not important

3. Do you believe AI-powered tools can provide effective feedback on language learning tasks? (Choose one of the options.)

☐ Yes.

☐ No.

☐ Unsure.

4. Which of the following do you think are the most effective ways to use AI in language learning? Select all that apply.

☐ Providing personalised feedback on grammar and vocabulary exercises

☐ Creating interactive simulations and virtual reality environments

☐ Facilitating conversation practice with virtual tutors

☐ Adapting learning materials based on the student's progress

☐ Creating personalised exercises and quizzes based on the learner's needs and goals

☐ Automatically marking written assignments and suggesting improvements

☐ Other

☐ I do not think AI has helped me in my learning journey so far.

5. Learning a new language involves many skills. Which ones would you prefer an AI tool to help you improve the most? Select all that apply.

☐ My listening comprehension skills (understanding spoken language)

☐ My speaking fluency (ability to speak more confidently and naturally)

☐ My reading comprehension skills (understanding written text)

☐ My writing accuracy (grammar and vocabulary usage)

☐ My pronunciation (sounding like a native speaker)

☐ All of the above.

☐ None of the above. I do not trust AI.

6. Some believe that AI tools can be helpful for practising speaking a language. How helpful do you think AI can be? Choose one of the options.

☐ Very helpful ☐ Not helpful

☐ Helpful

☐ Neutral

☐ Not very helpful

The Interview: Questions and Answers (in English)

General Experience (2 questions)

1. How would you describe your overall experience with the flipped classroom activities? Choose one of the options.

☐ a) Very good

☐ b) Good

☐ c) Satisfactory

☐ d) Poor

☐ e) Unsatisfactory

2. Did you feel the difficulty level of the tasks changed when using AI compared to those without AI? Choose one of the options.

☐ a) Easier with AI

☐ b) Slightly easier with AI

☐ c) Similar level of difficulty with and without AI

☐ d) Slightly harder with AI

☐ e) Harder with AI

Learning Strategies (2 questions)

3. Did using AI in the second set of activities encourage you to try different learning strategies? (e.g., using new vocabulary apps) Choose one of the options.

☐ a) Yes

☐ b) No

☐ c) Somewhat

4. Did AI help you complete the tasks more efficiently? Choose one of the options.

☐ a) Always

☐ b) Usually

☐ c) Sometimes

☐ d) Rarely

☐ e) Never

Motivation and Engagement (2 questions)

5. How engaging were the tasks with AI assistance compared to those without AI? Choose one of the options.

☐ a) Significantly more engaging with AI

☐ b) Somewhat more engaging with AI

☐ c) No difference in engagement level with or without AI

☐ d) Somewhat less engaging with AI

☐ e) Significantly less engaging with AI

6. How did your confidence level in completing the tasks change when using AI compared to without AI? Choose one of the options.

☐ a) Much more confident with AI

☐ b) Slightly more confident with AI

☐ c) My confidence level remained the same

☐ d) Slightly less confident with AI

☐ e) Significantly less confident with AI

Learning Outcomes (2 questions)

7. Did you feel you learned more effectively from the tasks with AI support compared to the tasks without AI? Choose one of the options.

☐ a) Strongly agree: AI significantly improved my learning experience.

☐ b) Agree: AI provided some helpful support for my learning.

☐ c) Neutral: I learned equally well with and without AI.

☐ d) Disagree: AI did not consistently help me learn more effectively.

☐ e) Strongly disagree: AI did not help me learn more effectively at all.

8. Which language skill or skills (listening, speaking, reading and writing) did AI help you the most? Select all that apply.

☐ a) listening

☐ b) speaking

☐ c) reading

☐ d) writing

☐ e) none of the above

Comparison and Preferences (2 questions)

9. Considering both learning experiences (with and without AI-assisted tools), which method did you find more beneficial to your learning? Choose one of the options.

☐ a) Significantly more beneficial with AI-assisted tools

☐ b) Somewhat more beneficial with AI-assisted tools

☐ c) No significant difference (Both methods were equally beneficial.)

☐ d) Somewhat less beneficial with AI-assisted tools

☐ e) Significantly less beneficial with AI-assisted tools

10. What improvements would you like to see in future flipped classroom activities, regardless of whether they involve AI or not? (Choose up to 3.)

☐ a) More interactive activities (both with and without AI)

☐ b) Clearer instructions and better task management

☐ c) A wider variety of learning materials and tools, including AI tools

☐ d) More collaborative learning activities (group discussions, presentations, pair work, brainstorming)

☐ e) customised exercises and quizzes based on the student's needs and objectives

☐ f) More opportunities for self-paced and personalised learning

☐ g) others

Open-Ended Questions (2 questions)

11. After participating in this study, how could AI be further developed to improve the language learning experience? You may write your answer in bullet points.

_____

_____

12. Imagine you could design your ideal AI language learning tool for the flipped classroom. What features would it offer? You may write your answer in bullet points.

_____

_____

Explanation and Informed Consent Form for Participants

Numerical code: …….

Dear Student,

I am currently conducting a research study for my master's dissertation in English Didactics, entitled "Integrating Artificial Intelligence in the Flipped Classroom Approach".

The research aims to better understand how AI can impact adult students' motivation performance and results when learning English.

This study requires your permission and willingness to participate in it. Those participating in this research study will need to:

a) provide personal information;

b) answer a questionnaire;

c) do AI activities and journal the experience;

d) participate in a follow-up interview.

All information provided will be solely for this study and will be safely kept under my supervision. Your personal information will not be used in the study, and you will be referred to by a numerical code, along with a pseudonym, whenever/if needed.

Participating in this study is not mandatory, and there will be no negative impact on your relationship with me as your teacher or your marks. Your thoughts and comments on this study will surely be appreciated, and they will provide valid information to help other language teachers and me refine foreign language teaching methods and strategies.

Kind regards,

Nélson José Ponte Rodrigues

Researcher's Contact Information:

If you have any further questions regarding participating in this study, please contact me.

nelson.jose.rodrigues@gmail.com

STUDENT CONSENT FORM

In order to participate in the study, **you must be at least 18 years old**. If not, please do not sign the form.

Please select an option:

☐ Yes. I am willing to provide personal information and answer questionnaires regarding this study. I am also willing to participate in the follow-up interview and allow recording.

☐ No, I am not willing to participate in this study.

Student's name:

_____

E-mail: _____

Contact number: _____

Date: ___/ ____/ 2024

Signature:

_____

Appendixes