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Smart Teaching: The Synergy of Multiple Intelligences and Artificial Intelligence in English as a Foreign Language Instruction

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ABSTRACT

This article investigates the integration of Howard Gardner's Multiple Intelligences (MI) theory with Artificial Intelligence (AI) tools in English as a Foreign Language (EFL) instruction. MI theory, which highlights diverse cognitive strengths, has been transformative in inclusive education, while AI tools, such as chatbots, offer personalised feedback, interactive learning environments, and differentiated instruction that align with MI principles. By adopting a conceptual research design, this study synthesises existing literature and case studies to propose strategies for engaging various intelligences using AI technologies. Key applications include personalised feedback for linguistic and logical-mathematical learners, immersive simulations for spatial intelligence, and collaborative platforms to support interpersonal intelligence. Practical strategies for integrating AI tools into MI-based instruction are discussed, alongside considerations for tailoring educational experiences to diverse learner profiles. Ethical concerns, such as data privacy and algorithmic bias, are addressed, emphasising the importance of responsible AI integration and teacher training to maximise these tools' potential. The study provides a robust pedagogical framework showcasing the synergy between MI theory and AI technologies, demonstrating how this approach can enhance engagement, motivation, and inclusivity in EFL classrooms. While conceptual, the study lays the groundwork for future empirical research and underscores the potential of AI-enhanced MI-based instruction in fostering dynamic and equitable language learning environments.

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1. Introduction

The educational landscape is continuously evolving, driven by the need to meet the diverse learning needs of students in an increasingly complex world. Howard Gardner's Multiple Intelligences (MI) theory, introduced in 1983, is among the most transformative contributions to educational theory. Gardner's theory challenged the traditional, monolithic view of intelligence, which a focus on linguistic and logical-mathematical abilities as the primary measures of cognitive capacity had long dominated. Instead, Gardner proposed that intelligence is a multifaceted construct encompassing a range of distinct cognitive abilities[1, 2]. These intelligences include linguistic-verbal, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic intelligences. Each of these intelligences represents a different way of processing information and learning, thereby offering a more holistic understanding of human potential.

MI theory has had a profound impact on educational practices worldwide. By recognising that students possess varied cognitive strengths and learning preferences, MI theory has encouraged educators to move beyond one-size-fits-all teaching methods. Instead, it promotes the design of instructional strategies that cater to students' diverse intelligences, thereby creating more inclusive and effective learning environments[3]. In the context of language education, this approach is particularly relevant, as language learning involves a broad spectrum of cognitive processes, including verbal communication, pattern recognition, and cultural understanding.

Parallel to the theoretical advancements introduced by MI theory, the rapid development of Artificial Intelligence (AI) technologies has begun to reshape educational practices in unprecedented ways[4]. AI-driven tools, particularly chatbots like ChatGPT, Claude, Gemini, etc., have emerged as powerful assets in the classroom, offering capabilities such as personalised feedback, real-time interaction, and adaptive learning environments[5]. These technologies can potentially revolutionise language education by addressing students' individual needs and providing them with tailored learning experiences. However, while the benefits of AI in education are increasingly recognised, integrating AI tools with MI theory still needs to be explored, especially in English as a Foreign Language (EFL) instruction.

The traditional EFL classroom often emphasises linguistic and logical-mathematical skills, which are essential for language acquisition but may only partially engage students who excel in other intelligences[6]. This conventional approach can lead to disengagement among students with strengths in spatial reasoning, interpersonal communication, or musical ability. The challenge, therefore, is to create an instructional framework that uses both MI theory and AI tools to cater for the full range of intelligences in the classroom. By investigating how AI can be aligned with MI principles, this paper seeks to provide practical strategies for educators to engage all intelligences, thereby improving language acquisition outcomes and fostering a more inclusive learning environment. Such an approach could enhance student engagement and motivation and lead to more effective and meaningful language learning experiences.

This article explores integrating MI theory with AI-driven chatbots in the EFL classroom to personalise language instruction based on students' cognitive strengths. It aims to provide practical strategies for educators to engage all intelligences, improving language acquisition outcomes and creating a more inclusive and dynamic learning environment.

Integrating AI tools with Howard Gardner's MI theory offers a novel approach to language instruction, allowing for highly personalised learning experiences that cater for students' diverse cognitive strengths. By aligning AI-driven technologies, such as chatbots, with MI principles, educators can deliver tailored feedback and adaptive learning environments that engage a broader range of intelligences. This synergy between AI and MI represents a significant shift in educational practices, promoting inclusivity and more dynamic language learning opportunities. As a result, this integrative approach might offer a promising framework for fostering more meaningful and effective language learning in the EFL classroom.

2. Theoretical Foundations of Multiple Intelligences in Language Education

Gardner's MI theory, first introduced in 1983, revolutionised the way educators understand intelligence. Gardner argued that intelligence is not a single, monolithic ability but rather a collection of distinct cognitive capacities [1], including linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, intrapersonal, and naturalistic intelligences [7]. This multifaceted view of intelligence has significant implications for language education, where traditional methods often emphasise linguistic and logical-mathematical skills at the expense of other forms of intelligence [3]. Gardner further explained that his theory challenges the conventional broad view of general intelligence and offers a more comprehensive perspective on cognitive differences in human beings [2]. Although MI theory has gained significant acceptance among educators [8, 9], it has also faced criticisms questioning its applicability. Some critics argued that the term "talents" might be more appropriate than "intelligences" based on how the theory describes these distinct abilities [10].

2.1. Empirical Evidence of MI in EFL Education

Research has demonstrated the benefits of applying MI theory in the classroom. For instance, Savaş found that incorporating activities tailored to different intelligences, such as using music for musical learners or role-playing for bodily-kinesthetic learners, increased student engagement and motivation [11]; while collaborative group work can engage interpersonal intelligence [12]. Similarly, Mokhtar et al. emphasised that project-based learning (PBL) could effectively harness multiple intelligences, providing students with opportunities to engage in tasks that resonate with their cognitive strengths [13]. Studies have shown that students taught through MI-based strategies demonstrate improved creative thinking abilities and critical reading skills [14, 15].

Empirical studies support the efficacy of MI-informed instruction in the EFL context. Jado examined the implementation of MI theory in Arabic language textbooks and found that activities designed to engage different intelligences led to improved comprehension and retention among students [16]. Similarly, Andarab and Rouhi highlighted the role of visual aids in enhancing the understanding of idiomatic expressions in English, demonstrating the importance of catering to spatial intelligence in language instruction [17]. These findings are consistent with the broader literature, which suggests that MI-based approaches can lead to better language outcomes by catering to the diverse learning styles present in any classroom [14].

A study by Bakić-Mirić at the University of Niš Medical School illustrated the positive impact of MI theory on English language learning [18]. The research showed that students exposed to MI-based instruction not only improved their language skills but also developed a more positive attitude towards learning. Similarly, Tiansoodeenon and Sitthitikul reported that the application of MI theory in English language teaching resulted in a more inclusive classroom environment, where students' diverse abilities were recognised and nurtured [19].

Empirical studies support the application of MI theory in EFL education, showing that tailored activities based on students' diverse intelligences enhance engagement, motivation, and language learning outcomes.

2.2. Integrating AI Chatbots in EFL Instruction

The rise of AI tools may offer new opportunities to enhance language learning by providing personalised, immediate feedback and fostering a more interactive learning environment. AI chatbots can support the implementation of MI theory in several ways, aligning with the distinct intelligences identified by Gardner.

Integrating AI tools with MI theory presents new possibilities for personalising language instruction to meet diverse learning needs. AI can facilitate the identification of students' unique intelligence profiles and tailor instruction accordingly [20]. This adaptability is crucial in educational settings, particularly in language learning, where traditional approaches may not effectively cater for all students.

AI tools can analyse student interactions and performance data to provide real-time feedback and recommendations, supporting self-regulated learning [21]. Additionally, AI-driven platforms can foster interactive learning environments, offering personalised scaffolding that aligns with students' learning preferences [22]. This dynamic interaction

supports academic achievement and promotes metacognitive reflection, helping students develop critical thinking about their learning processes [23], and it is a key factor in shaping job preferences [24].

AI chatbots align with MI theory by offering personalised feedback and adaptable learning experiences, engaging various intelligences and supporting differentiated instruction in EFL classrooms.

2.3. The Role of AI in Supporting MI-Informed Education

The integration of AI with Howard Gardner's MI theory presents a compelling framework for enhancing educational practices. MI theory posits that individuals possess different kinds of intelligences, such as linguistic, logical-mathematical, spatial, and interpersonal, among others. AI technologies align with MI principles by offering personalised educational experiences that cater to the diverse intelligences of learners. For instance, AI tools can analyse individual learning styles and preferences, allowing educators to tailor their teaching strategies accordingly, thus fostering an inclusive learning environment that resonates with MI theory [25, 26].

AI's adaptability is particularly significant in addressing the unique needs of learners. Traditional educational methods often adopt a one-size-fits-all approach, which can overlook the varied intelligences present in a classroom. However, AI-powered systems can provide customised learning pathways that adjust in real time based on student performance and engagement [27–29]. This adaptability is crucial in language learning contexts, where students may have different strengths in linguistic versus logical-mathematical intelligences. AI applications can facilitate differentiated instruction by providing resources and activities that align with each student's dominant intelligences, thereby enhancing their overall learning experience [30, 31].

Moreover, the use of AI in education promotes a more dynamic interaction between students and learning materials. For instance, AI-driven language learning applications can offer interactive exercises that adapt to the user's proficiency level, thereby supporting linguistic intelligence while also engaging other intelligences through multimedia content [32, 33]. This multifaceted approach not only aids in language acquisition but also encourages students to engage with content that resonates with their personal learning styles, thus reinforcing the MI framework [6].

Furthermore, the ethical implications of AI in education must be considered, particularly regarding data privacy and algorithmic bias [34]. As AI systems become more integrated into educational practices, it is essential to ensure that they are designed to promote equitable access and inclusivity, aligning with the core principles of MI theory that advocate for recognising and valuing diverse intelligences [35]. Educators must be equipped with the knowledge and tools to implement AI responsibly, ensuring that these technologies enhance learning without compromising ethical standards [36, 37].

Thus, the intersection of AI and MI theory offers transformative potential for education by enabling personalised, adaptive learning experiences that cater for the diverse intelligences of students. By leveraging AI technologies, educators can create more inclusive and effective learning environments that not only recognise but also celebrate the unique capabilities of each learner.

Integrating AI chatbots into MI-informed education offers several advantages. Firstly, AI can provide the personalised feedback necessary for effective learning. As Pitychoutis noted, the ability of AI to offer "immediate personalised feedback" (p. 197) can significantly enhance the language learning experience, particularly in writing [34]. This is crucial in EFL contexts where timely and specific feedback is essential for student progress [38].

Also, AI chatbots can accommodate diverse learning styles, providing different types of input and feedback tailored to individual students' needs. This aligns with Krashen's input hypothesis, which suggests that language acquisition occurs when learners are exposed to comprehensible input slightly above their current proficiency level [39]. AI can adjust the complexity of its responses to match each student's abilities, making it a valuable tool for differentiated instruction.

However, it is also important to consider the challenges associated with AI integration. Pitychoutis highlighted concerns about over-reliance on AI tools and the potential for reinforcing erroneous language patterns [34]. These challenges underscore the need for careful implementation and ongoing assessment to ensure that AI is used effectively and ethically in the classroom.

AI technologies can support MI-informed education by offering personalised learning experiences that cater to students' varied intelligences. However, ethical considerations must be addressed to ensure equitable and responsible AI use in education.

2.4. Applications of AI Chatbots across Multiple Intelligences

AI chatbots can be effectively integrated into language instruction by catering to various types of intelligences identified by Gardner's Multiple Intelligences theory[1]. For students with linguistic intelligence, chatbots offer opportunities for conversational practice and writing feedback. Pitychoutis emphasised that the immediate feedback provided by chatbots is crucial for developing language skills in EFL learners[34], aligning with the principles of communicative language teaching (CLT), which values interaction and real-time language use[40]. Similarly, students with logical-mathematical intelligence benefit from AI-generated language games and grammar exercises that challenge their problem-solving skills and pattern recognition, enhancing their engagement with the language[11].

Students with strong spatial intelligence can take advantage of immersive learning experiences created by AI-powered tools, such as virtual reality (VR) simulations. For instance, AI tools like Sora.ai generate virtual environments where students can navigate and describe what they observe in English, improving both their spatial reasoning and language skills[3]. Meanwhile, AI chatbots can also support musical intelligence by generating customised songs or rhythmic exercises, which help students learn new vocabulary and improve pronunciation in an engaging, memorable way[41].

Bodily-kinesthetic learners can benefit from AI-driven role-playing scenarios that simulate real-life situations, such as ordering food or asking for directions, allowing students to practice language in a physical, interactive context[42]. For students with interpersonal intelligence, group projects and collaborative work facilitated by AI tools, such as ChatGPT's conversation mode, offer opportunities for meaningful social interaction and dialogue, thus improving language skills through real-time collaboration[13].

Intrapersonal intelligence is supported through AI chatbots that guide students in self-reflection and goal-setting activities, prompting them to assess their progress, set new learning objectives, and track their achievements over time. This approach fosters autonomy and self-awareness, essential aspects of language learning[43]. Lastly, for students with naturalistic intelligence, AI can simulate nature-themed content or create interactive activities that explore environmental topics, making language learning more relevant and engaging for these learners[1].

AI chatbots can engage MI in the EFL classroom by providing personalised, interactive learning experiences. These tools support diverse learners by catering to their unique cognitive strengths.

3. Research Design

This study adopts a conceptual research design, focusing on the theoretical integration of MI theory and AI tools in EFL instruction. The research is based on an extensive literature review on MI theory and AI applications in education, alongside an analysis of case studies and existing frameworks that illustrate their combined impact. Through a critical synthesis of these sources, the study proposes a pedagogical framework that uses AI-driven tools to support differentiated instruction based on MI principles. This conceptual design allows for exploring innovative strategies for personalising language learning without direct empirical data collection, focusing instead on current research's potential benefits and challenges[44].

Sources were selected based on specific inclusion criteria to ensure a comprehensive review and synthesis. Apart from Gardner's introduction to the MI theory in 1983, peer-reviewed journal articles, books, and conference proceedings published within the last 20 years (2003–2024) were prioritised, particularly those focused on MI theory, AI in education, and language learning. Databases such as Google Scholar, JSTOR, and Scopus were used to identify relevant studies. The search terms included combinations of "Multiple Intelligences theory," "Artificial Intelligence," "AI chatbots," "EFL instruction," and "personalised learning." Articles were selected based on their relevance to the theoretical integration of MI and AI, the robustness of their empirical or conceptual contributions, and their alignment with the educational context of EFL.

The analysis involved a qualitative synthesis of the selected literature. Studies were categorised based on their

contributions to either MI theory or AI applications in education, as no particular research intersected both domains. Case studies were incorporated where available, particularly those demonstrating practical applications of AI tools in language learning contexts. These case studies provided valuable insights into the potential challenges and benefits of integrating AI into MI-based instruction.

The synthesis of these sources led to the development of a proposed pedagogical set of activities, which highlights how AI-driven tools can support differentiated instruction based on MI principles. Although the research does not involve empirical data collection, the conceptual design is grounded in a rigorous analysis of current literature and existing educational practices, allowing for the exploration of innovative strategies for personalising language instruction.

4. Practical Strategies for Incorporating Multiple Intelligences Theory in the EFL Classroom

Incorporating MI theory into the EFL classroom, alongside AI tools, offers educators a framework to address the diverse cognitive strengths of their students. This section outlines practical strategies that leverage MI theory and AI technologies to effectively engage different intelligences, thereby enhancing language acquisition and student engagement. By tailoring instruction with the support of AI-driven tools, teachers can create a more inclusive and dynamic educational environment. The following strategies provide actionable insights into how MI theory and AI tools can practically integrate into everyday teaching practices.

4.1. Differentiated Instruction

Differentiated instruction is a key approach to incorporating Multiple Intelligences (MI) theory in the classroom. This strategy involves tailoring teaching methods and activities to cater to different intelligences, ensuring that each student can engage with the material in a way that aligns with their strengths. Teachers can implement MI theory by designing lesson plans incorporating activities targeting various intelligences. For instance, storytelling can engage linguistic intelligence; role-playing can appeal to bodily-kinesthetic intelligence, and visual aids can support visual-spatial intelligence[45].

Students with linguistic intelligence benefit from activities that involve language use and analysis, such as reading comprehension exercises, storytelling, debates, and writing tasks. These activities help them develop their linguistic skills by writing essays, creating dialogues, or leading class discussions[1]. AI tools can further support these students by providing conversational practice, generating writing prompts, or offering immediate feedback on grammar and vocabulary usage.

For students with logical-mathematical intelligence, instructors can use problem-solving activities, puzzles, and grammar exercises that require pattern recognition. These learners excel in tasks like analysing sentence structures, creating grammar rules, or organising vocabulary lists[11]. AI tools can generate language games that involve logical problem-solving, such as identifying patterns in verb conjugations or syntax structures or even designing detective puzzles to engage these students.

Visual aids, such as mind maps, charts, and infographics, are effective for students with spatial intelligence[16]. These learners may enjoy tasks that involve drawing, designing posters, or creating visual storyboards to represent language concepts. AI platforms like Sora.ai can assist in generating visual content or creating interactive activities, such as virtual tours where students describe what they see in English.

For bodily-kinesthetic learners, teachers can incorporate movement-based activities, such as role-playing, drama, or language games that require physical interaction[3]. These students learn effectively through activities like acting out dialogues, participating in charades, or using gestures to memorise vocabulary. AI tools can simulate real-life scenarios where students must interactively use language, such as in role-playing games.

Music and rhythm are useful tools for supporting students with musical intelligence. Lessons can include songs, rhymes, and chants to help these learners absorb new vocabulary or practice pronunciation through rhythmic exercises[41]. AI tools like Suno.com can generate customised songs or rhymes that align with the vocabulary or grammar points being taught.

Group work and collaborative projects are ideal for students with strong interpersonal intelligence[13]. These

students thrive in social settings, making activities like peer teaching, group discussions, and debates highly effective. They can also take on leadership roles within group tasks. AI tools can facilitate peer learning by enabling students to collaborate on projects virtually, with chatbots acting as moderators or providing guidance.

Intrapersonal intelligence can be nurtured through activities that promote self-reflection and independent study [43]. These students may benefit from journaling in English, setting personal language goals, or engaging in self-assessment exercises. AI chatbots can serve as personal tutors, guiding students through reflective exercises, helping them set and achieve learning goals, or offering personalised feedback on their progress [34].

Finally, for students with strong naturalistic intelligence, lessons can include nature-themed content and outdoor activities [1]. Instructors can engage these learners by incorporating readings about the environment, discussing weather patterns, or even conducting language activities outdoors. AI tools can generate nature-related experiences, create interactive content that explores environmental topics, or even simulate cultural patterns and artefacts for students to analyse.

4.2. Project-Based Learning (PBL)

Project-based learning is an effective way to incorporate multiple intelligences into the EFL classroom. PBL allows students to engage in comprehensive tasks that require various intelligences. For example, a project on 'Cultural Festivals Around the World' could involve research (logical-mathematical intelligence), writing reports (linguistic intelligence), creating visual presentations (spatial intelligence), and organising a class presentation or role-play of a festival (bodily-kinesthetic and interpersonal intelligences) [42]. This enhances language skills and encourages collaboration, creativity, and critical thinking. AI tools can assist students in research, generate ideas, or help them draft parts of their projects by providing relevant information and language models.

4.3. Use of Authentic Materials

Using authentic materials that cater to different intelligences can significantly enhance language learning, as they align with students' cognitive strengths. For example, integrating songs, music videos, and podcasts into the curriculum can effectively engage students with musical intelligence. These materials can be utilised to teach vocabulary, pronunciation, and cultural nuances. Analysing song lyrics can be a stimulating way to explore idiomatic expressions or cultural references, making learning more meaningful and engaging [41]. AI tools can support this by generating or suggesting song lyrics based on the language level and themes of the lesson, allowing students to work together in groups to compose the accompanying music.

Films, documentaries, and images are effective learning tools for students with spatial intelligence. Watching a film with subtitles, for instance, can help students improve their listening and reading skills at the same time, while exposing them to various accents and dialects [16]. AI tools can aid in creating discussion questions or summaries to promote deeper comprehension and analysis of the visual content, enhancing the learning process.

Incorporating content related to the environment, animals, and natural phenomena can engage students with strong naturalistic intelligence. Reading articles about wildlife or discussing environmental and cultural issues provides both educational and engaging material for these learners [1]. AI tools can create opportunities for interactive learning by facilitating discussions with imaginary environmentalists or generating quizzes on natural topics, making language learning more relevant and enjoyable for students with naturalistic intelligence.

4.4. Technology Integration

Technology offers a variety of tools that can support Multiple Intelligences (MI)-based instruction in the EFL classroom, enhancing personalised learning experiences for students. Interactive software, such as language learning apps, often caters to multiple intelligences by incorporating various activities, including reading, listening, and speaking exercises. These apps frequently include game-like elements, which appeal to bodily-kinesthetic and logical-mathematical learners, fostering engagement through movement and problem-solving [11]. AI chatbots enhance these tools by creating custom interactive exercises tailored to each student's learning preferences.

Digital storytelling is another effective tool for engag-

ing different intelligences. As Mokhtar et al. explained, students can use online platforms to create digital stories [13], which tap into linguistic, spatial, and interpersonal intelligences. In this activity, students write, design, and share their stories with peers, promoting creativity and collaboration. AI tools can assist by providing story prompts, editing suggestions, or even generating parts of the story, which students can then build upon.

Virtual reality (VR) is instrumental in creating immersive language learning experiences. By engaging spatial and bodily-kinesthetic intelligences, VR tools make learning more dynamic and interactive [3]. For example, a virtual tour of an English-speaking city can allow students to practice their language skills while exploring a new environment, making learning both experiential and relevant [46]. AI platforms can enhance these experiences by guiding the virtual tour, asking questions, or engaging students in dialogues based on the virtual environment, ensuring that learning is interactive and aligned with individual intelligences.

4.5. Role-Playing and Drama

Role-playing and drama activities are particularly effective for students with bodily-kinesthetic, interpersonal, and linguistic intelligences. For example, the instructor may set up a "real-life" scenario, such as a restaurant or airport, where students must use English to interact [42]. These activities build language skills and help students develop confidence and fluency in a fun, low-pressure environment. AI chatbots can simulate customer-service interactions, providing students with instant feedback and a safe space to practice.

4.6. Reflection and Self-Assessment

Incorporating reflection and self-assessment activities allows students to engage with their intrapersonal intelligence, fostering greater awareness of their learning processes and progress. Journaling is one effective method, where students are encouraged to maintain a language journal to reflect on what they have learned, set personal goals, and track their progress over time [43]. This practice empowers students by allowing them to take ownership of their learning journey. AI tools can enhance this process by providing reflective prompts, reviewing journal entries, and suggesting areas for improvement based on the students' reflections.

Another valuable tool for promoting self-assessment is using portfolios, where students compile their work overtime, allowing them to observe their growth and accomplishments [1]. Portfolios cater to both intrapersonal and spatial intelligences by visually representing progress and offering a structured way to reflect on achievements. AI tools can assist in organising and assessing the portfolios, providing feedback on language development and content mastery, and further supporting students in understanding their learning journey.

4.7. Collaboration and Peer Review

Encouraging collaboration and peer review in the classroom taps into students' interpersonal intelligence while also benefiting those with other dominant intelligences. Group projects are an excellent way to foster collaboration, requiring students to work together on tasks such as creating presentations or conducting surveys [13]. These activities build a sense of community and enable students to leverage each other's strengths, creating a richer learning experience. AI tools can facilitate this process by providing real-time feedback or suggestions during the project development, ensuring that collaboration is both productive and engaging.

Peer review is another valuable method for enhancing interpersonal intelligence while simultaneously developing critical thinking and communication skills. By engaging in peer review sessions, students provide constructive feedback on each other's work, learning to articulate their thoughts clearly and respectfully [42]. AI chatbots can further support this process by acting as mediators, offering tips on giving effective feedback and assisting in clarifying language issues. This combination of collaboration and AI-driven support encourages a more interactive, communicative, and reflective learning environment, benefiting students across various intelligences.

5. Challenges and Considerations

While integrating MI and AI in language instruction offers significant benefits, it also presents challenges. Educators need to develop the digital competencies required to effectively utilise AI tools in alignment with MI principles [47]. The need for more consensus on the curricular content and delivery methods for AI education poses another challenge.

Edmett et al. conducted research with 1,348 EFL teachers from 118 countries and found that while a large percentage of teachers use AI tools (76%), only 20% have received adequate training[48]. Aghaziarati et al. pointed out the need for a comprehensive understanding of teacher attitudes towards AI in education, which can significantly influence the successful integration of AI tools in the classroom[49]. This is particularly relevant in MI-informed education, where diverse teaching strategies must cater to different learning styles.

The successful integration of AI tools within an MI framework in the EFL classroom is contingent upon comprehensive teacher training and professional development. Educators must be equipped not only with the technical skills to utilise AI-driven tools but also with a deep understanding of how these tools can be aligned with MI principles to cater to the diverse cognitive strengths of their students[1, 3]. Effective training programs should therefore provide a solid foundation in MI theory, hands-on experience with AI technologies, and ongoing professional development opportunities[34, 46].

Integrating technology in the classroom has inherent barriers, such as limited institutional infrastructure[50] and inadequate digital tools[51]. As this approach requires relatively advanced AI features, most companies that offer platforms to use advanced AI require paid subscriptions[52], which presents another consideration for the applicability of the proposed approach.

Ethical considerations surrounding AI use in education, such as data privacy and algorithmic bias, are crucial to ensuring that AI is used responsibly and equitably in the classroom[35, 53].

Despite the promising potential of combining AI and MI in EFL education, practical challenges still need to be addressed, including resource limitations, resistance to change, and supportive educational policies[47, 54]. Schools must ensure that teachers have access to the necessary technology and infrastructure and are supported through well-designed training programs that demonstrate the tangible benefits of these innovations[22, 40]. By focusing on these key areas—teacher preparation, ethical implementation, and overcoming practical barriers—educators can create more inclusive, engaging, and effective learning environments that fully leverage the strengths of both AI and MI theory.

6. Conclusions

This article explored the potential of integrating MI theory with AI tools, particularly chatbots, in the EFL classroom. The findings suggest that the synergy between AI and MI can enhance language instruction by personalising learning experiences according to students' cognitive strengths. AI-driven tools can provide tailored feedback, immersive learning experiences, and differentiated instruction, making language learning more inclusive and engaging for learners with varied intelligences. This approach holds promise for fostering increased student motivation, engagement, and language acquisition outcomes.

However, this conceptual research also identified several limitations. The study relied on existing literature and case studies without direct empirical data collection. As such, the effectiveness of AI and MI theory integration in diverse classroom settings remains largely theoretical. Furthermore, practical challenges such as limited access to AI technologies, the need for teacher training, and ethical concerns around data privacy and AI bias must be addressed to ensure successful implementation.

Future research should focus on conducting empirical studies to assess the effectiveness of AI-enhanced MI-based instruction in real-world EFL classrooms. Investigating how specific AI tools can support different intelligences and exploring the long-term impact of these technologies on language learning outcomes will be the next step. Finally, researching the scalability of AI tools in low-resource educational environments and developing frameworks to ensure ethical AI use will be crucial for the broader adoption of innovative teaching practices.

Authors Contributions

Conceptualisation, K.M.P. and A.A.R.; methodology, K.M.P.; investigation, K.M.P. and A.A.R.; resources, K.M.P. and A.A.R.; writing-original draft preparation, K.M.P.; writing review and editing, A.A.R. and K.M.P.; visualisation, K.M.P. and A.A.R.; supervision, K.M.P. All authors have read and agreed to the published version of the manuscript.

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