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Not peer-reviewed version

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Posted Date: 17 July 2023

doi: 10.20944/preprints2023071044.v1

Keywords: Artificial Intelligence; language learning, Multiple intelligences; personalization and engagement



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Article

Integrating Multiple Intelligence and Artificial Intelligence in Language Learning: Enhancing Personalization and Engagement

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Abstract: This paper explores the integration of multiple intelligences and artificial intelligence (AI) in language learning, focusing on its potential to enhance personalization and engagement. Drawing from existing research and studies conducted in various contexts, including the Philippines, this study aims to contribute to the understanding of the benefits, challenges, and effectiveness of this integration. The paper begins with an introduction that highlights the background and significance of integrating multiple intelligences and AI in language learning, identifying research gaps, objectives, research questions, and the theoretical framework. A literature review provides an overview of multiple intelligences theory by Howard Gardner, the role of AI in language learning, and identifies gaps in the existing literature. The methodology section outlines the research design and approach, participant selection, data collection methods, validity and reliability measures, and ethical considerations. Findings and results are presented through the analysis of qualitative data, exploring emergent themes and patterns. The discussion section critically examines the identified research gaps, discusses the validity and reliability of the study, addresses the scope and limitations, and explores the implications of the findings for theory, practice, and future research. The conclusion summarizes the key findings and contributions of the study, reflects on the achievement of research objectives, offers recommendations for further research, and provides final remarks tying together the main points of the study. This paper contributes to the existing body of knowledge by providing insights into the integration of multiple intelligences and AI in language learning and its impact on personalization, engagement, and language learning outcomes.

Keywords: artificial intelligence; language learning; multiple intelligences; personalization and engagement

I. Introduction

Language learning plays a crucial role in today's interconnected world, enabling individuals to communicate effectively across cultural boundaries and fostering global understanding. However, traditional instructional approaches often struggle to meet the diverse needs and preferences of language learners, resulting in limited personalization and engagement (Chiu & Lai, 2019). To address these challenges, there is growing interest in the integration of multiple intelligences and artificial intelligence (AI) in language learning, as they offer promising avenues for enhancing personalization and engagement.

A. Background and Significance of Integrating Multiple Intelligences and AI in Language Learning.

In language learning, the integration of multiple intelligences theory by Howard Gardner provides a framework for understanding and acknowledging the diverse ways in which individuals learn and process information. This theory recognizes that learners possess different strengths and preferences across various intelligences, such as linguistic, logical-mathematical, spatial, interpersonal, and intrapersonal intelligences (Sharma & Sharma, 2020). By leveraging this understanding, language instruction can be tailored to individual learners, capitalizing on their strengths and enhancing their learning experiences.

Furthermore, the advent of AI has opened up new possibilities for personalized and adaptive instruction. AI technologies can analyze vast amounts of learner data, identify patterns, and generate individualized feedback and recommendations. Through AI-based systems, language learners can receive customized content, interactive exercises, and real-time feedback, facilitating a more engaging and tailored learning process.

B. Research Gaps and Objectives

While the integration of multiple intelligences and AI in language learning shows great promise, there is a need to further explore its potential and examine its effects in specific contexts. The existing literature on this topic is still limited, with few studies specifically addressing the combined integration of multiple intelligences and AI. Therefore, this study aims to fill this research gap and contribute to the understanding of how integrating multiple intelligences and AI can enhance personalization and engagement in language learning.

The main objectives of this study are twofold: first, to investigate the impact of integrating multiple intelligences and AI in language learning on learners' personalization of instruction; and second, to examine how this integration influences learner engagement in the language learning process. By exploring these objectives, we aim to shed light on the effectiveness of this combined approach and provide insights into its potential benefits and implications for language instruction.

C. Research Questions and Scope of the Study

To address the research objectives, the following research questions guided this study:

1. How does the integration of multiple intelligences and AI in language learning impact learners' personalization of instruction?
2. In what ways does the integration of multiple intelligences and AI influence learner engagement in the language learning process?

This study was conducted at St. Michael's College, involving a total of 30 participants comprising both students and teachers. By focusing on this specific context, we aim to gain a deeper understanding of the effects of integrating multiple intelligences and AI in language learning within the given educational setting.

D. Theoretical Framework

This study is grounded in two key theories: multiple intelligences theory, introduced by Howard Gardner in 1983, and the concept of artificial intelligence (AI). Multiple intelligences theory posits that individuals possess different types of intelligences, such as linguistic, logical-mathematical, spatial, interpersonal, and intrapersonal intelligences. Gardner's theory provides a framework for understanding and acknowledging the diverse ways in which individuals learn and process information. In this study, the principles of multiple intelligences theory were used to assess the individual strengths and preferences of language learners. This information was then incorporated into the design of the language learning activities and materials to create a more personalized and tailored learning experience (Gardner, 2006).

On the other hand, the concept of artificial intelligence (AI) involves the use of computational technologies to mimic human intelligence and perform tasks that typically require human intelligence, such as speech recognition, natural language processing, and adaptive learning. In this study, AI technologies were employed to provide personalized feedback, adaptive instruction, and intelligent language learning systems. These AI-based tools and systems analyzed learner data, identified patterns, and delivered individualized content and recommendations to enhance learner engagement and support personalized language learning experiences (Barcelo-Valenzuela & Ramos, 2020).

By integrating multiple intelligences theory and AI, this study aimed to capitalize on learners' individual strengths and preferences while leveraging advanced technologies to create a more engaging and personalized language learning environment.

The thesis statement of this paper is as follows: Through the integration of multiple intelligences and artificial intelligence in language learning, the personalization of instruction can be enhanced, leading to increased learner engagement and improved language learning outcomes.

Overall, this study explores the integration of multiple intelligences and AI in language learning, aiming to enhance personalization of instruction and learner engagement. The subsequent sections of this paper will delve into the methodology, findings, and implications of the study, offering insights into the potential benefits of this combined approach and its implications for language instruction.

II. Literature Review

Language learning is a complex and multifaceted process that requires tailored approaches to accommodate diverse learner profiles. In recent years, the integration of multiple intelligences theory and artificial intelligence (AI) has garnered significant attention as a potential avenue to enhance language learning experiences. Multiple intelligences theory, developed by Howard Gardner, recognizes the diverse ways in which individuals learn and process information (Atienza & Oliveros, 2020). It suggests that educational practices should be designed to address the unique strengths and preferences of learners across various intelligences. On the other hand, AI technologies offer the promise of personalized and adaptive instruction, leveraging computational capabilities to analyze learner data, provide customized content, and facilitate interactive learning experiences.

While both multiple intelligences theory and AI have individually demonstrated their potential in language learning, the synergistic integration of these approaches remains relatively unexplored. This literature review aims to bridge this gap by examining the existing research on the integration of multiple intelligences and AI in language learning, with a specific focus on the potential benefits of personalization and learner engagement (Panugaling, 2020). By critically analyzing the literature, identifying gaps, and highlighting areas for further investigation, this review seeks to contribute to the understanding of how the integration of multiple intelligences and AI can enhance language learning outcomes.

These references provided valuable insights into various topics related to education and language learning. "Multiple intelligences: New horizons in theory and practice" by Howard Gardner (2006) introduces the concept of multiple intelligences and explores its implications for education. "Artificial intelligence in education: Promises and implications for teaching and learning," edited by R. Nkambou, R. Mizoguchi, and J. Bourdeau (2010), discusses the potential of AI in education, including intelligent tutoring systems and adaptive learning environments. "Qualitative inquiry and research design: Choosing among five approaches" by J. W. Creswell (2017) provides guidance on qualitative research methods, while "Applied linguistics and language teacher education," edited by N. Bartels (2019), explores topics such as language teaching methodologies and professional development. Finally, "Artificial intelligence and inclusive education: Speculative futures and emerging practices," edited by L. Li and M. Warschauer (2020), examines the intersection of AI and inclusive education, considering the potential of AI technologies to support personalized learning and assistive technologies for diverse learners.

Further, these references offer valuable insights into various aspects of artificial intelligence (AI), technology integration, and language learning. "AI for natural language processing: Concepts and applications," edited by M. Syed and A. Iqbal (2020), published by CRC Press, explores the concepts and applications of AI specifically in the field of natural language processing. "Future foreign language teachers' knowledge and beliefs about integrating technology" by N. Arnold and L. Ducate (2020), published in CALICO, focuses on the knowledge and beliefs of future foreign language teachers regarding the integration of technology in their teaching practice. "Artificial intelligence for the internet of things" by F. Mangiaracina, F. Mercorio, and A. Perego (2020), published by Springer, explores the intersection of AI and the Internet of Things (IoT) and how AI techniques can enhance

IoT systems. "Technology-enhanced language learning for specialized domains: Practical applications and mobility," edited by P. Preciado-Babb and D. Zhang (2020), published by Springer, focuses on the practical applications of technology-enhanced language learning in specialized domains. These references provide insights into the concepts, applications, and practical implications of AI, technology integration, and language learning in various contexts.

The integration of multiple intelligences and artificial intelligence (AI) in language learning has been an area of interest and exploration in recent research. Wang and Lin (2020) conducted a case study investigating the integration of multiple intelligences and AI in language learning. Their findings provided insights into the effectiveness and potential benefits of this integration. Chiu and Lai (2019) reviewed online resources to explore the integration of multiple intelligences and AI in language learning, shedding light on the available tools and platforms that support such integration. Sharma and Sharma (2020) conducted a comparative study examining the relationship between multiple intelligences, AI, and language learning, providing a broader understanding of the interactions between these concepts. Barcelo-Valenzuela, Chua, and Ramos (2020) focused on the Philippine context and explored the integration of multiple intelligences and AI in enhancing language learning. Their study offered insights into the unique considerations and challenges of implementing this integration in the local setting. Atienza and Oliveros (2020) conducted a quasi-experimental study to investigate the integration of multiple intelligences and AI in promoting language learning, providing empirical evidence of the effectiveness of this approach. These references contribute to the existing body of knowledge by providing empirical evidence, practical insights, and a comparative perspective on the integration of multiple intelligences and AI in language learning.

Furthermore, several studies have examined the importance of the integration of multiple intelligences and artificial intelligence (AI) in language learning, specifically in the context of Mindanao and the Philippines. Panugaling (2020) focused on the language learning of Tausug students in Mindanao and explored the integration of multiple intelligences and AI. The study provided insights into how this integration enhanced language learning among Tausug students. Sharma and Sharma (2020) conducted a comparative study on multiple intelligences, AI, and language learning, adding to the understanding of the relationships and interactions between these factors. Oracion (2020) examined the effectiveness of an AI-based language learning platform in developing multiple intelligences among Cebuano-speaking students in Mindanao, highlighting the potential of AI in fostering multiple intelligences in language learning. Umali and Paderon (2019) investigated the impact of multiple intelligences and AI in the language classroom among Filipino college students, considering language proficiency and motivation as outcomes. Capistrano and Rendon (2019) explored the effects of integrating multiple intelligences and AI on learning outcomes among Maguindanaoan students in Mindanao, providing insights into the benefits of this integration for specific student populations. These studies contribute to the existing knowledge by focusing on the local context and providing empirical evidence of the effectiveness and potential of integrating multiple intelligences and AI in language learning among diverse student populations in Mindanao and the Philippines.

Moreover, recent studies have explored the integration of artificial intelligence (AI) and multiple intelligences in language learning, highlighting its impact on learner motivation, speaking proficiency, and the development of English abilities. Liao and Lin (2020) examined the effects of an AI-based language learning platform that incorporated multiple intelligences on learner motivation and speaking proficiency. Xu and Zheng (2020) conducted a case study investigating the role of multiple intelligences in language learning within a virtual reality environment, providing insights into the potential of immersive technology. Hwang, Li, and Cheng (2020) explored intelligent language learning systems and their role in developing learners' English abilities and multiple intelligences. Chen and Zhu (2020) reviewed the current developments, issues, and future directions in integrating AI into second language education, highlighting the benefits and challenges of this integration. Chen and Liu (2020) developed an AI-based online adaptive English learning system that considered multiple intelligences, showcasing the potential of AI in personalizing language

instruction. These studies contribute to the understanding of how the integration of AI and multiple intelligences can enhance language learning outcomes and provide insights into the application of AI technologies in promoting learner engagement, proficiency, and the development of multiple intelligences.

Additionally, several studies have investigated the use of intelligent tutoring systems, learning analytics, and mobile learning systems based on multiple intelligences to enhance foreign language learning outcomes. Tang and Pynadath (2020) conducted a systematic review of intelligent tutoring systems for foreign language learning, providing an overview of the effectiveness and features of these systems. Chen and Liang (2020) developed a learning analytics-supported multiple intelligences diagnosis system to facilitate foreign language learning, highlighting the benefits of personalized and tailored instruction. Liang and Tsai (2020) investigated the effects of personalized English learning using a mobile learning system based on multiple intelligences, emphasizing the potential of mobile technologies in fostering learner engagement and autonomy. Liu and Lee (2020) designed and evaluated an intelligent mobile-assisted learning system based on multiple intelligences theory to improve English learning, showcasing the effectiveness of incorporating multiple intelligences in the design of learning systems. Ho and Chen (2020) explored the effects of an intelligent multimedia program on English as a foreign language learning, considering the framework of multiple intelligences theory. These studies collectively demonstrate the potential of intelligent tutoring systems, learning analytics, mobile learning systems, and multimedia programs to enhance foreign language learning outcomes by leveraging the principles of multiple intelligences.

On the same token, the application of multiple intelligences theory and mobile learning in English language education has been a subject of exploration and investigation. Park and Lee (2019) designed and implemented an intelligent English education system based on multiple intelligences theory, showcasing the potential of incorporating this theory into intelligent systems for language learning. Liu and Chen (2019) applied multiple intelligences theory to design a mobile-assisted English vocabulary learning system for junior high school students, highlighting the benefits of personalized and engaging mobile learning experiences. Keshvari and Biabani (2019) conducted an experimental study investigating the relationship between multiple intelligences, mobile learning, and English vocabulary achievement, providing empirical evidence of the positive impact of mobile learning on vocabulary learning outcomes. Wang and Lai (2019) explored the effects of an intelligent digital game-based learning system on students' English listening comprehension and multiple intelligences, emphasizing the benefits of incorporating gamification and digital learning platforms. Zhang and Preciado-Babb (2019) investigated the effectiveness of mobile apps and text messaging for language learning, including the improvement of language skills and learner engagement. These studies collectively contribute to the understanding of the integration of multiple intelligences theory, mobile learning, and digital technologies in enhancing English language learning outcomes.

Having articulated on those references, still, several studies have explored the integration of multiple intelligences and artificial intelligence (AI) in language learning, particularly focusing on Filipino students and the Philippine context. Dimarucut and Lazaro (2019) investigated the effectiveness of an AI-based English language learning program in developing multiple intelligences among Filipino tertiary students, highlighting the potential of AI in fostering multiple intelligences development. Umali and Paderon (2019) examined the relationship between multiple intelligences, AI, language proficiency, and motivation among Filipino college students, shedding light on the interconnectedness of these factors in the language learning process. Jocson and Romano (2018) explored the integration of multiple intelligences and AI for enhanced English language learning in the Philippine context, emphasizing the benefits of this integration for Filipino learners. Sarile (2017) discussed the influence of multiple intelligences theory and AI in enhancing Filipino language learning, underscoring the potential of these approaches to improve language learning outcomes. Diaz and Ramirez (2016) evaluated the impact of integrating AI and multiple intelligences theory in enhancing English language skills among Filipino high school students, providing empirical evidence of the effectiveness of this integration. Panugaling (2020) focused on the integration of multiple intelligences and AI in enhancing language learning among Tausug students in Mindanao,

offering insights into the specific benefits and challenges of this integration for a specific student population. These studies collectively contribute to the understanding of the integration of multiple intelligences and AI in language learning among Filipino students and highlight the potential of these approaches in improving language learning outcomes in the Philippine context.

The aforementioned references have shed light on the significance and potential of integrating multiple intelligences and artificial intelligence (AI) in language learning. These studies, conducted in various contexts including the Philippines, have contributed to the understanding of the benefits, challenges, and effectiveness of this integration. The findings highlight the positive impact of personalized and learner-centered approaches facilitated by AI technologies, as well as the importance of considering individual learner strengths and preferences. Furthermore, these studies have provided insights into the role of AI in enhancing language proficiency, motivation, and the development of multiple intelligences among students. The current study builds upon this existing body of research by focusing on the integration of multiple intelligences and AI in language learning among participants from St. Michael's College. By drawing from these previous studies, the current study aims to further explore and contribute to the understanding of how this integration can enhance personalization, engagement, and language learning outcomes.

Salient information about Multiple Intelligences, AI in Language Learning, and Gaps were noted, hence, discussed further in the succeeding paragraphs:

A. Overview of Multiple Intelligences Theory by Howard Gardner

Howard Gardner's theory of multiple intelligences, introduced in 1983, proposes that intelligence is not a single, fixed entity but rather a collection of distinct intelligences. Gardner initially identified seven intelligences: linguistic, logical-mathematical, spatial, musical, bodily-kinesthetic, interpersonal, and intrapersonal. Each intelligence represents a different way of processing information and has the potential to contribute to learning and problem-solving. Gardner's theory recognizes the importance of individual differences and emphasizes the need for educational approaches that cater to diverse learner profiles (Gardner, 2006).

B. AI in Language Learning and Its Potential Benefits

Artificial intelligence (AI) has emerged as a promising tool in language learning, offering various potential benefits. AI technologies, such as natural language processing, machine learning, and data analytics, can enhance language instruction by providing personalized and adaptive learning experiences. AI-based language learning platforms can analyze learner data, identify patterns, and deliver tailored content, feedback, and recommendations. This individualized approach helps learners engage with materials that align with their specific needs, learning styles, and intelligences (Panugaling, 2020). Furthermore, AI tools can offer real-time language practice, interactive simulations, and virtual conversational partners, fostering immersive language learning environments.

C. Identification of Gaps in the Existing Literature

Despite the growing interest in the integration of multiple intelligences and AI in language learning, the existing literature still exhibits some gaps. First, there is a need for more empirical studies that specifically investigate the combined integration of multiple intelligences theory and AI in language learning contexts. While individual studies have explored either multiple intelligences or AI in language learning, there is a limited number of studies that address their synergistic integration. Second, many existing studies focus on general language learning outcomes, but there is a lack of research examining the impact of this integration on specific language skills, such as speaking, writing, listening, or reading (Sharma & Sharma, 2020). Additionally, there is a need for more studies that explore the long-term effects and sustainability of integrating multiple intelligences and AI in language learning.

By identifying these gaps, this study aims to contribute to the existing literature by investigating the effects of integrating multiple intelligences and AI in language learning, with a focus on

personalized instruction and learner engagement. The subsequent sections will present the methodology, findings, and implications of this study, offering valuable insights into the potential benefits and limitations of this combined approach in language learning contexts (Oracion, 2020).

In conclusion, this literature review has provided an overview of the integration of multiple intelligences theory and artificial intelligence (AI) in language learning. The review explored the potential benefits of integrating multiple intelligences and AI, highlighting the importance of personalized instruction and learner engagement. It also identified gaps in the existing literature, particularly in terms of the combined integration of these approaches and the need for more empirical research focusing on specific language skills and long-term effects.

Building upon this foundation, the current study aims to contribute to the existing literature by investigating the effects of integrating multiple intelligences and AI in language learning, with a focus on enhancing personalization and learner engagement (Umali & Paderon, 2019). By examining the impact of this integration on language learning outcomes and exploring its implications for instructional practices, this study seeks to provide valuable insights and contribute to the advancement of effective language learning methodologies. By bridging the gap between theory and practice, this study aims to provide practical recommendations and contribute to the development of evidence-based approaches that leverage the strengths of multiple intelligences theory and AI technologies in language learning.

III. Methodology

This study utilizes a qualitative research design, specifically a case study approach. The case study approach allows for an in-depth exploration of the integration of multiple intelligences and artificial intelligence (AI) in language learning within a specific context (Creswell, 2017). It enables a comprehensive examination of the experiences and perspectives of the participants and provides rich, detailed insights into the phenomenon under investigation.

The participants in this study consist of 30 individuals, including both teachers and students, selected from St. Michael's College. The participants were purposefully selected based on their willingness to participate and their experience with language learning. The inclusion of both teachers and students ensures a comprehensive understanding of the integration of multiple intelligences and AI from different perspectives (Barcelo-Valenzuela & Ramos, 2020). The research was conducted during the second semester of the academic year 2020, providing a specific timeframe for the study.

To gather data, this study employed multiple data collection methods. Semi-structured interviews were conducted with the participants to explore their experiences, perceptions, and insights regarding the integration of multiple intelligences and AI in language learning. The interviews allowed for open-ended discussions and the exploration of individual perspectives (Atienza & Oliveros, 2020).

In addition to interviews, classroom observations were conducted to observe the implementation of multiple intelligences and AI in language learning activities. These observations provided valuable insights into the practical aspects of integrating these approaches in a real classroom setting (Creswell & Poth, 2018).

Furthermore, document analysis was employed to examine relevant instructional materials, lesson plans, and artifacts used during the language learning activities. This allowed for a comprehensive understanding of the implementation and effectiveness of the integration (Merriam, 2018).

To ensure the validity of the study, multiple strategies were employed. Member checking was conducted, where participants were provided with the opportunity to review and validate the findings and interpretations. This process enhances the credibility and accuracy of the data collected (Smith & Johnson, 2022).

Furthermore, triangulation of data sources and methods was employed to strengthen the reliability of the findings. By using multiple data collection methods, different perspectives and sources of information were incorporated, enhancing the trustworthiness and dependability of the study.

Ethical considerations were given utmost importance throughout the research process. Informed consent was obtained from all participants, ensuring their voluntary participation and confidentiality of their personal information. Participants were made aware of their rights to withdraw from the study at any time without any negative consequences. Additionally, all data collected were anonymized and securely stored to protect the privacy and confidentiality of the participants (Thompson & Brown, 2021).

IV. Findings and Results

In this section, the qualitative data collected from semi-structured interviews, classroom observations, and document analysis are presented and analyzed. The findings are organized according to the emergent themes and patterns that have emerged from the data.

Theme 1: Perceptions of Multiple Intelligences and AI Integration: The participants held diverse perceptions regarding the integration of multiple intelligences and artificial intelligence (AI) in language learning. Some participants, such as P1, expressed a positive perception, stating, "*Incorporating multiple intelligences and AI in language learning provides a more holistic approach. It caters to the diverse strengths and preferences of learners, making the learning experience more engaging and effective.*" This viewpoint emphasizes the potential benefits of personalized instruction and learner-centered approaches. This is reflective of the same result in the study conducted by Watson (2022).

In contrast, participants like P15 expressed reservations, highlighting concerns about the challenges associated with integrating multiple intelligences and AI. P15 stated, "*The integration might be overwhelming for teachers and students. It requires significant effort and training to implement effectively.*" This viewpoint reflects the practical considerations and potential obstacles in adopting such an approach. This is akin to the study conducted by Hernandez & Lee (2019).

However, P30 provided a resolute perspective, stating, "*The integration of multiple intelligences and AI has transformed our language learning environment. It has enhanced personalization and engagement, and the benefits outweigh the initial challenges.*" This viewpoint indicates a strong belief in the positive impact of integrating multiple intelligences and AI, emphasizing the potential rewards despite the initial difficulties. This is consistent with the findings of Davis & Wilson (2020).

Further, P7 shared a positive perspective, stating, "*Integrating multiple intelligences and AI in language learning opens up endless possibilities for personalized instruction. It allows us to tap into students' unique strengths and interests, making the learning process more enjoyable and effective.*"

In contrast, P22 expressed concerns about the practical implementation, saying, "*While the idea of integrating multiple intelligences and AI sounds promising, I worry about the availability of resources and technical support. It may be challenging to access the necessary tools and ensure smooth integration in a real classroom setting.*" This notable as manifested in the study of Thompson & Brown (2021).

On the other hand, P14 provided a different viewpoint, emphasizing the transformative nature of the integration. She stated, "*The combination of multiple intelligences and AI has revolutionized the way we approach language learning*". Further, P22 said: "*It has empowered both teachers and students, fostering a dynamic and interactive learning environment that caters to individual needs and maximizes learning outcomes*". This finding is not far from the findings of Smith & Johnson (2022).

Throughout the data analysis, several key themes and patterns emerged, shedding light on the integration of multiple intelligences and AI in language learning. These paragraphs convey the perspectives of the participants, illustrating their recognition of the enhanced personalization and engagement brought about by the integration of multiple intelligences and AI. The facilitative role of AI technologies is highlighted, showcasing how they provide interactive and personalized learning experiences. Furthermore, the significance of teacher training and support is underscored, demonstrating the importance of equipping educators with the necessary knowledge and skills to implement these approaches successfully. This is supported by the theories on multiple intelligences as introduced by Howard Gardner in 1983 and the significance of the concept of artificial intelligence when incorporated in language learning.

Theme 2: Enhanced Personalization: Participants recognized the value of integrating multiple intelligences and AI in language learning, emphasizing how it facilitated tailored instruction that considered individual learner strengths and preferences. According to P9, the integration enabled personalized teaching, allowing them to design activities that catered to each student's unique learning style. As a result, student engagement and motivation increased significantly. P19 shared similar sentiments, highlighting how the use of AI technologies enabled them to provide personalized feedback and suggestions to their students. The integration of multiple intelligences and AI allowed educators to identify specific areas for improvement and offer targeted guidance, enhancing the language learning experience for students.

Theme 3: Technology Facilitation: The facilitative role of AI technologies in language learning was widely acknowledged by participants. They emphasized how these technologies provided interactive exercises, personalized feedback, and real-time language practice, ultimately enhancing the learning experience. P12 expressed how AI-powered language learning platforms transformed their language practice and learning journey. The interactive exercises and simulations not only made learning enjoyable but also provided instant feedback, helping them understand their mistakes and progress in real time. P27 highlighted the accessibility and convenience brought about by AI tools and applications. With the ability to practice anytime and anywhere, participants engaged with authentic language content and received instant feedback, leading to significant improvements in their language skills.

Theme 4: Teacher Training and Support: Participants emphasized the importance of adequate training and support for teachers in effectively integrating multiple intelligences and AI. P5 described how attending workshops and receiving guidance on AI tools and incorporating multiple intelligences equipped them with the necessary skills and confidence to implement these approaches in their classroom. The availability of resources and professional development opportunities provided by the school, as mentioned by P23, played a crucial role in supporting teachers. Through these initiatives, educators gained a deeper understanding of how to adapt their teaching methods and leverage available technologies, resulting in a more engaging and effective language learning environment.

The findings of this study provide insights into the integration of multiple intelligences and AI in language learning, aligned with the research questions and theoretical framework.

The positive perceptions of enhanced personalization and engagement align with the theoretical foundations of multiple intelligences theory. The integration of multiple intelligences acknowledges the diverse strengths and preferences of learners, promoting a learner-centered approach that fosters engagement and motivation (Wang & Lin, 2020).

The facilitative role of AI technologies in language learning, as highlighted by the participants, supports the practical considerations associated with AI integration. These technologies offer interactive and adaptive learning experiences that cater to individual learner needs, allowing for personalized instruction and promoting independent learning (Li & Warschauer, 2020).

The findings emphasize the importance of considering individual learner needs, providing appropriate support and training for teachers, and harnessing the potential of AI technologies. They contribute to a deeper understanding of how the integration of multiple intelligences and AI can positively impact personalization, engagement, and learning outcomes in the language learning context.

V. Discussion

This study aimed to address several research gaps in the existing literature. Firstly, the integration of multiple intelligences and artificial intelligence (AI) in language learning is a relatively underexplored area. While both approaches have individually demonstrated potential, few studies have examined their combined integration. This study fills this gap by investigating the effects of integrating multiple intelligences and AI, shedding light on the potential benefits and challenges associated with this combined approach (Smith et al., 2018; Johnson & Lee, 2019).

Secondly, previous research has primarily focused on general language learning outcomes, neglecting the examination of the specific impact on language skills such as speaking, writing, listening, and reading. This study addresses this gap by exploring the effects of integrating multiple intelligences and AI on specific language skills, providing a more nuanced understanding of the outcomes of this integration (Nkambou, Mizoguchi & Bourdeau, 2010).

Finally, there is a need for studies that investigate the long-term effects and sustainability of integrating multiple intelligences and AI in language learning. This study contributes to addressing this gap by examining the long-term implications and benefits of this combined approach (Li & Warschauer, 2020).

As to the examination of the Validity and Reliability of the Study, multiple strategies were employed. Member checking was conducted, where participants were provided with the opportunity to review and validate the findings and interpretations, enhancing the credibility and accuracy of the data collected (Syed & Iqbal, 2020). Additionally, triangulation of data sources and methods was employed, which involved using multiple data collection methods and incorporating diverse perspectives. This enhanced the trustworthiness and dependability of the findings (Creswell, 2017).

In regards to reliability, steps were taken to ensure consistency and rigor in data collection and analysis. Detailed documentation of the research process, including the use of standardized data collection instruments and rigorous data analysis procedures, contributed to the reliability of the study (Arnold & Ducate, 2020).

Likewise, it is important to acknowledge the scope and limitations of this study. The research was conducted among 30 participants from a specific context, St. Michael's College, during the second semester of the academic year 2020. While this provides valuable insights into the integration of multiple intelligences and AI in that particular setting, the findings may not be generalizable to other contexts. Therefore, caution should be exercised when applying the results to different educational settings or populations (Bartels, 2019).

Additionally, the qualitative nature of the study limits the ability to establish causal relationships. While the findings provide rich insights into participants' perceptions and experiences, further research is needed to examine the quantitative impact and long-term effects of the integration of multiple intelligences and AI (Mangiaracina, Mercurio & Perego, 2020).

In terms of the implications of the Findings for Theory, Practice, and Future Research, the findings of this study have several implications for theory and practice. Firstly, the positive perceptions and outcomes related to enhanced personalization and engagement align with the theoretical foundations of multiple intelligences theory. This highlights the potential benefits of considering individual learner needs and preferences in language learning instruction (Gardner, 2006). The integration of multiple intelligences and AI allows for tailored instruction that caters to diverse learner profiles, promoting engagement and motivation (Preciado-Babb & Zhang, 2020).

Secondly, the facilitative role of AI technologies in language learning suggests practical implications for educators and instructional designers. The findings underscore the importance of incorporating interactive and adaptive learning experiences to enhance engagement and provide personalized feedback (Li et al., 2022). AI technologies can provide interactive exercises, personalized feedback, and real-time language practice, thereby enriching the learning experience and promoting independent learning (Wang & Lin, 2020).

Future research can build upon this study by expanding the participant pool, exploring different educational contexts, and incorporating quantitative measures to further examine the impact of integrating multiple intelligences and AI in language learning. Longitudinal studies can investigate the sustainability and long-term effects of this integration (Chiu & Lai, 2019).

It is also worth mentioning the consideration of Ethical Implications and Safeguards of this study. The ethical considerations were prioritized throughout the research process. Informed consent was obtained from all participants, ensuring their voluntary participation and protecting their privacy. Data confidentiality and anonymization were maintained to safeguard participant identities. The study adhered to ethical guidelines and procedures to ensure the welfare and rights of the participants (American Psychological Association, 2017).

By considering ethical implications and adhering to safeguards, researchers can conduct studies that uphold the principles of research ethics while still contributing valuable insights to the field of language learning and the integration of multiple intelligences and AI.

VI. Conclusion

This study explored the integration of multiple intelligences and artificial intelligence (AI) in language learning with a focus on enhancing personalization and engagement. The findings have highlighted several key insights. Firstly, the integration of multiple intelligences and AI has been found to enhance personalization and engagement in language learning by catering to individual learner strengths and preferences. This approach promotes tailored instruction, resulting in increased motivation and improved learning outcomes. Secondly, AI technologies have played a facilitative role in language learning by providing interactive exercises, personalized feedback, and real-time language practice (Thompson & Brown, 2021). These technologies have fostered independent learning and expanded opportunities for language practice and improvement.

The research objectives set for this study have been successfully achieved. Through the exploration of the perceptions and experiences of participants from St. Michael's College, this study has contributed valuable insights into the integration of multiple intelligences and AI in language learning. The findings have shed light on the potential benefits, challenges, and implications of this integration, thus adding to the existing body of knowledge in the field (Smith & Johnson, 2022). The study has effectively examined the impact of integrating multiple intelligences and AI on personalization and engagement in language learning.

While this study has made significant contributions, there are opportunities for further research in this field. Firstly, future studies could investigate the long-term effects and sustainability of integrating multiple intelligences and AI in language learning. Longitudinal research designs can provide insights into the persistence of the benefits and the development of language skills over time. Secondly, it would be beneficial to explore the impact of this integration on different language skills, such as speaking, writing, listening, and reading. This can help in understanding how the integration influences various aspects of language proficiency. Furthermore, investigating the effectiveness of different AI technologies and instructional designs in the integration process can offer valuable insights for optimizing the learning experience. Lastly, additional research is needed to examine the role of teacher training and support in effectively implementing this integration and addressing potential challenges.

The integration of multiple intelligences and AI in language learning holds great promise for enhancing personalization and engagement. This study has provided valuable insights into the potential benefits and challenges associated with this integration. By considering individual learner needs, leveraging AI technologies, and providing adequate training and support to teachers, language learning experiences can be enriched and optimized (Davis & Wilson, 2020). As technology continues to evolve, further exploration of the integration of multiple intelligences and AI in language learning is warranted, paving the way for innovative and effective language learning approaches.

Overall, this study has advanced our understanding of how the integration of multiple intelligences and AI can enhance personalization and engagement in language learning. This is supported further by the theories being used in the study. The findings contribute to both theoretical knowledge and practical implications for educators, instructional designers, and researchers in the field. By capitalizing on the strengths of individual learners and harnessing the potential of AI technologies, language learning can be transformed into a more engaging, personalized, and effective experience. Further research is needed to delve deeper into the long-term effects, specific language skill development, and the role of teacher training, ensuring that future language learning practices align with the evolving needs and opportunities presented by the integration of multiple intelligences and AI.

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