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Artificial Intelligence for English Language Learning and Teaching: Advancing Sustainable Development Goals

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***Abstract*—This study explores the affordance of Artificial Intelligence (AI) to English language learning and teaching, focusing on its alignment with the United Nations' Sustainable Development Goals (SDGs). It aims to investigate the role of AI in enhancing language education and fostering student-centered learning. Data for this study were collected through semi-structured interviews with 18 English teachers to gather qualitative insights into their experiences with AI-powered language learning tools. The findings reveal that the teachers have positive appraisals of AI that its use has six major impacts: i) enhancing the personalization of learning; ii) contributing to improved learning outcomes by advancing students' speaking, listening, reading, and writing skills; iii) playing a fundamental role in bridging educational gaps; iv) enhancing students' engagement and motivation; v) empowering educators with professional development opportunities; vi) and encouraging self-directed learning. This study argues that, if implemented thoughtfully, AI can enhance language learning outcomes and create an environment conducive to student engagement and success.**

***Index Terms*—artificial intelligence, English language teaching, sustainable development goals, language learning**

I. Introduction

In recent years, the fusion of technology and education has birthed a transformative force that is reshaping the way we learn and teach. Artificial Intelligence (AI), once relegated to the realms of education, has stepped out of the pages and into our classrooms, offering a potent promise of enhancing the educational experience. Its integration into the field of education is marked by innovations that are both exciting and far-reaching, with AI's capabilities extending to various facets of the learning process.

While AI's influence on education is profound, its implications for English language learning and teaching are particularly noteworthy (Dreimane & Upenieks, 2020; Biletska et al., 2021; Haleem et al., 2022). The significance of English proficiency in today's interconnected world cannot be overstated. English is not just a language; it is a gateway to opportunities, a means of communication that transcends borders, and a key skill demanded by employers worldwide (Adriansen et al., 2022). As a lingua franca of business, science, diplomacy, and the internet, proficiency in English can open doors to education, employment, and global collaboration (Al-Smadi et al., 2020).

In the context of the United Nations Sustainable Development Goals (SDGs), particularly Quality Education (SDG 4), this article scrutinizes the transformative potential of Artificial Intelligence (AI) in English language learning. It explores AI's fundamental role in enhancing accessibility, effectiveness, and inclusivity within language education,

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aligning with the broader mission of global sustainable development. The primary objective of this study is to investigate AI's impact on English language learning and teaching, with a specific focus on Quality Education (SDG 4), Reduced Inequalities (SDG 10), and Decent Work and Economic Growth (SDG 8), gathering insights through semi-structured interviews with English language teachers. The central question guiding this inquiry is: How do English language teachers perceive AI's influence on language education, considering its alignment with the SDGs? By incorporating English teacher perspectives, this article provides a comprehensive understanding of AI's role in language education, enhancing the discussion and analysis.

II. Literature Review

A. AI in English Language Learning

In the realm of English language learning, Artificial Intelligence (AI) has emerged as a transformative force, offering personalized and adaptive learning experiences that traditional classrooms often struggle to provide (Liao et al., 2021; Kamalov et al., 2023). AI-powered platforms such as TalkPal, Languate, and Praktika AI excel in addressing the diverse needs and learning paces of individual students. These platforms possess the remarkable ability to analyze a learner's strengths and weaknesses, continuously monitor progress, and dynamically adapt content accordingly (Shemshack et al., 2021). For instance, if a student excels in vocabulary but struggles with pronunciation, the AI system can allocate more time and resources to pronunciation exercises, ensuring that learners receive customized support. This adaptability leads to more efficient and effective language acquisition (Bilad et al., 2021).

AI's influence extends beyond adaptability, ushering in an era of convenience and accessibility in language education. Mobile apps, chatbots, and virtual tutors powered by AI are accessible 24/7, allowing learners to practice and improve their English skills at their own pace and convenience (Bilad et al., 2021; Biletska et al., 2021). Language learning apps like Duolingo, Babbel, and Rosetta Stone employ AI algorithms to offer interactive and engaging lessons, utilizing gamification and real-time feedback to keep learners motivated while tracking their progress (Wei, 2023). AI-driven chatbots, exemplified by Microsoft's popular chatbot, provide conversational English practice with immediate responses and corrections, facilitating authentic language usage and conversational skill development. Additionally, virtual tutors offered by companies such as VIPKid and iTalki leverage AI to schedule sessions, match learners with appropriate tutors, and deliver personalized teaching materials. These platforms have gained popularity for offering interactive, engaging, and effective language learning experiences, all made possible by AI-driven personalized and adaptive approaches (Wei, 2023; Kamalov et al., 2023).

AI's evolving role in English language learning promises even more innovative solutions in the future. As technology advances, the potential for AI to make language learning more accessible and effective becomes increasingly evident (Kessler, 2018; Wei, 2023). These developments align seamlessly with the broader goals of education and sustainable development, ushering in an era where language proficiency is more attainable and relevant than ever before (Vinuesa et al., 2020; Kamalov et al., 2023).

AI-enhanced language education brings forth distinct advantages that reshape English language learning's landscape, focusing on accessibility, affordability, and scalability (Bilad et al., 2023). Traditional barriers, often linked to geographical constraints, dissolve as AI-powered tools provide high-quality materials and resources, catering to remote or underserved learners. This newfound accessibility pairs with affordability, with AI-driven platforms frequently offering cost-effective or free alternatives, mitigating the financial burden often associated with language courses (Bilad et al., 2023). Learners can also sidestep commuting expenses, rendering AI-enhanced language learning a budget-friendly choice. Furthermore, AI's scalability ensures quality instruction for a vast number of learners simultaneously, essential in addressing the growing global demand for English education (Markauskaite et al., 2022).

Beyond accessibility and affordability, AI significantly bolsters learning outcomes. Personalized learning tailors the curriculum to each learner's strengths and weaknesses, allowing limitless practice in speaking, listening, reading, and writing, alongside instant feedback on pronunciation, grammar, and vocabulary usage (Shemshack et al., 2021; Wei, 2023). Gamification and interactive elements engage learners, potentially boosting retention and outcomes (Xu et al., 2023). Notable examples, such as VIPKid's use of AI algorithms for student-tutor matching, Pearson's AI-Powered English Test, and Education First's success with AI-enhanced English learning through EF English Live, underscore AI's positive impact on enhancing language education. These advancements render language learning more effective, accessible, and aligned with the goals of sustainable development, as AI's potential to transform language education becomes increasingly evident with evolving technology (Vinuesa et al., 2020; Kamalov et al., 2023).

Although AI's affordance and capability in language education are substantial, it also brings forth critical challenges and ethical concerns. Data privacy and bias in AI algorithms stand as prominent issues, necessitating stringent data protection measures and diverse development teams for bias mitigation (Dwivedi et al., 2021). Moreover, the risk of overreliance on technology potentially hindering holistic language development calls for a balance between AI-enhanced and traditional teaching methods (Abioye et al., 2021). Ethical considerations emphasize transparency, accountability, user consent, continuous monitoring, equity, and ethical education, reinforcing the need for responsible AI use. Developers must clarify AI capabilities and data usage, while learners should provide informed consent, and equitable access to AI-driven resources is crucial (Dwivedi et al., 2021; Abioye et al., 2021).

Some scholars argue that AI introduces conflicts and disruptions in traditional educational settings, impacting the roles of both learners and teachers (Leahy et al., 2019; Schiff, 2021). This divergence in opinions underscores the need for a comprehensive understanding of the concerns and perceptions within the educational community. The literature also reveals conflicting views on how AI affects the dynamics of education, presenting a landscape where opinions on its efficacy and potential pitfalls diverge. Some argue that AI in education empowers learners, providing personalized and adaptive learning experiences (Wei, 2023). Others, however, express reservations about the potential dehumanization of education and the depersonalization of the student-teacher relationship (Leahy et al., 2019; Schiff, 2021; Abioye et al., 2021).

To encapsulate the literature review section, it is evident that the discourse around AI in education is dynamic and multifaceted. By acknowledging the divergent perspectives and conflicts in the literature, we establish a foundation for the significance of our research. Additionally, in understanding the concerns and perceptions of teachers, we contribute valuable insights to the ongoing dialogue about the responsible and effective use of AI in language education. This, in turn, ensures responsible, equitable, and inclusive language education through AI.

B. Theoretical Framework

This study employs the Technology Acceptance Model (TAM) as the theoretical framework to investigate English language teachers' perceptions and experiences regarding the integration of Artificial Intelligence (AI) in language education. TAM, initially proposed by Davis (1989) and later extended by Venkatesh and Davis (2000), is a widely recognized model for understanding users' acceptance and adoption of technology, particularly in educational contexts.

At the core of the TAM framework are two key factors that influence individuals' technology acceptance: Perceived Ease of Use (PEOU) and Perceived Usefulness (PU). PEOU refers to the extent to which users perceive that using a particular technology is effortless and straightforward. On the other hand, PU reflects users' beliefs regarding the technology's capability to enhance their performance and effectiveness in their tasks.

In the context of language education, PEOU and PU are of paramount importance. English language teachers' perceptions of the ease with which AI-integrated language education tools can be incorporated into their teaching practices (PEOU) and the extent to which these tools are viewed as beneficial in enhancing students' language learning experiences (PU) significantly influence their willingness to embrace AI in their classrooms.

III. Methodology

A. Research Design

This study employs a qualitative research design, as it aims to explore the perceptions and experiences of English language teachers regarding the integration of Artificial Intelligence (AI) in language learning and education.

B. Data Collection Method

The primary data collection method consists of semi-structured interviews with English language teachers. This approach allows for in-depth exploration of teachers' perspectives, experiences, and insights on the topic (Merriam & Tisdell, 2015). Ethical considerations were carefully addressed, including obtaining informed consent from all participants for both participation in the study and audio-recording of semi-structured interviews.

C. Sampling

Purposive sampling was meticulously utilized to enlist English language teachers with significant experience in AI-integrated language education, ensuring participants possess pertinent knowledge and insights vital for this study. The research selectively recruited 18 English language teachers, all of whom are university lecturers with a minimum of two years of experience in integrating AI into language teaching. The composition of the group includes 8 individuals with master's degrees and 10 with Ph.D. degrees, all specializing in English language-related fields. The gender distribution comprises 7 males and 11 females, with an age range between 28 to 49. This methodological approach aims to capture a diverse range of perspectives and experiences within the cohort, enhancing the richness of the study. The sample size was determined through careful consideration of data saturation and the depth of analysis, aligning with the recommendations by Guest et al. (2020).

D. Data Analysis

The data in this study were audio-recorded to ensure accurate data capture. Subsequently, the recordings were transcribed to facilitate data analysis. The names of participants were replaced by pseudonyms (Teacher A, Teacher B, Teacher C etcetera). Data in this study were analyzed inductively in accordance with Brown and Clark’s (2006) thematic approach. The thematic analysis involved multiple stages, including data familiarization, coding, theme development, and interpretation.

IV. Findings

There were seven themes that emerged: i) enhanced personalization, ii) improved learning outcomes, iii) bridging educational gaps, iv) student-centered learning, v) engagement and motivation, vi) professional development for educators, and vii) ethical concerns and data privacy.

A. Enhanced Personalization

In the interviews with English language teachers, a resounding theme emerged, underscoring the remarkable capacity of AI-powered language learning tools to offer enhanced personalization in education. All the teachers who took part in this study praised these tools for their ability to provide highly tailored learning experiences, adapting to individual students' unique needs, preferences, and progress.

Teacher G, with evident enthusiasm, articulated the essence of this theme, stating,

"The beauty of AI-powered platforms is that they understand each student's strengths and weaknesses. It's like having a personal language coach. Students feel like the lessons are designed just for them".

This sentiment encapsulates the heart of AI-driven personalization—an experience akin to one-on-one guidance, where each student's journey is meticulously crafted to cater to their specific learning requirements.

Teacher L shared a compelling narrative, adding depth to the discussion:

"I've seen students who were struggling with grammar or pronunciation make remarkable improvements. The AI analyses their errors and adjusts the exercises accordingly. It's like having a virtual tutor by their side".

This vivid illustration of AI as a virtual tutor underscores its dynamic adaptability. The platform's ability to recognize and address individual challenges empowers students to overcome obstacles and improve their language proficiency.

Personalization, as Teacher C emphasized, serves as a cornerstone for maintaining student engagement: "Personalization is key to keeping students engaged. AI remembers their progress and adapts the difficulty level. It's not one-size-fits-all; it's tailored learning." Here, the concept of tailored learning emerges as a potent tool to sustain learners' interest. By calibrating content and pacing to suit individual needs, AI ensures that each student remains actively engaged.

Teacher M provided a practical perspective, highlighting the tangible benefits of personalized learning:

"AI platform's recommendations for extra practice are spot on. When students receive exercises that match their current level, it boosts their confidence and motivation".

The notion of boosting confidence resonates strongly. Personalized content not only aids in skill development but also nurtures a sense of accomplishment and enthusiasm, encouraging students to strive for further progress.

Furthermore, Teacher H highlighted the broader cultural context, remarking, "Personalization even extends to cultural context. AI offers content related to students' interests and backgrounds, making language learning effective and enjoyable." This insight underscores the holistic approach of AI in personalization. By integrating cultural relevance and catering to individual interests, language education becomes a vibrant and engaging experience, transcending mere efficacy to embrace enjoyment.

These insightful remarks collectively underscore the profound impact of AI in addressing diverse learning styles and individual student needs, positioning it as a transformative force in language education. In an educational landscape marked by diversity, AI serves as a unifying thread, tailoring instruction to cater to the unique tapestry of each student's learning journey. It fosters a sense of empowerment, motivation, and cultural inclusivity, shaping the future of language education into one that truly celebrates the individuality of every learner. As AI advances and refines its personalization capabilities, the promise of more effective, engaging, and individualized language learning experiences beckons—a promise that educators and students alike eagerly embrace.

B. Improved Learning Outcomes

The analysis of data highlighted the significant and positive impact of AI-powered language learning tools on students' learning outcomes. The teachers overwhelmingly attested to the transformative potential of these tools, emphasizing improvements in speaking, listening, reading, and writing skills.

Teachers spoke with genuine enthusiasm about the tangible benefits they observed. "I've witnessed students who were grappling with grammar and pronunciation make remarkable progress," noted Teacher B, vividly capturing the essence of this theme. The AI-powered platforms diligently analyze students' errors and adjust exercises accordingly, serving as a constant companion in the journey towards language proficiency.

Improved proficiency extends beyond grammar and pronunciation, as Teacher F highlighted:

"The AI's interactive exercises and language activities have had a profound impact on students' speaking and listening skills. It's like they have a conversation partner available anytime".

The power of AI to foster speaking and listening skills is particularly striking. Students gain the confidence to engage in real conversations, bridging the gap between classroom learning and practical application.

Equally significant is the impact on reading and writing skills. Teacher D underscored this point, stating,

"The platform's recommendations for extra practice are just great. When students receive exercises that match their current level, it improves their confidence and motivation".

Stimulating confidence and reinforcing motivation translate into more adept reading and writing, enabling students to express themselves fluently and effectively.

Moreover, as Teacher I pointed out, the benefits extend beyond linguistic proficiency: "Improved learning outcomes also encompass cultural awareness. AI tailors content to students' interests and backgrounds, enriching their understanding of the world." This broader perspective aligns with the holistic goals of education, transcending language skills to encompass cultural fluency and global awareness.

The unanimous consensus among teachers is that AI-driven language learning tools yield improvements that transcend traditional educational boundaries. Teacher A encapsulated this sentiment: "AI is a game-changer. It refines students' language skills, empowers them to communicate effectively, and ultimately prepares them for a globalized world".

These testimonials underscore the transformative potential of AI in language education, making it not merely a supplement but a catalyst for improved learning outcomes. The data from these semi structured interviews highlights that AI empowers students to navigate language confidently and fluently, equipping them with the skills to communicate effectively in a diverse and interconnected world. As AI continues to evolve, the promise of further improvements in learning outcomes beckons—a promise that educators eagerly embrace in their quest to provide the best possible education for their students.

C. Bridging Educational Gaps

AI-powered language learning tools are crucial in bridging educational gaps, particularly in underserved or remote areas. The teachers (75%, n=?) fervently endorsed the potential of these tools to extend access to quality language instruction, levelling the educational playing field for students regardless of their geographical location.

Teacher J emphasised the transformative impact of AI in this regard:

"In remote areas where access to language instruction is limited, AI can be a game-changer. It brings quality education right to the doorstep of those who need it the most".

This sentiment encapsulates the essence of bridging educational gaps through technology—offering educational opportunities where they were previously scarce.

Teacher C echoed this perspective, stating,

"AI doesn't discriminate based on location. It ensures that students in remote regions have access to the same resources and opportunities as those in urban areas".

The ability of AI to transcend geographical boundaries effectively dismantles the barriers to quality education.

Furthermore, Teacher K noted that in areas with a shortage of qualified language educators, AI steps in as a reliable resource, providing consistent and standardized instruction. This underscores the role of AI as a dependable ally in regions where staffing constraints may limit educational options.

The unanimous consensus among teachers is that AI-powered language education is a means to bridge the educational divide, leveling opportunities for all. It serves as a catalyst for achieving the United Nations' Sustainable Development Goal 10—Reduced Inequalities—by ensuring that quality language education reaches even the most remote and underserved communities.

These insights from teachers provide a compelling narrative of how AI in language education transcends traditional educational boundaries, making quality learning experiences accessible to all, regardless of their location. As Teacher D succinctly put it, "AI levels the educational playing field. It doesn't matter where you are; quality education comes to you".

In a world characterized by diversity and disparities in access to education, AI emerges as an equalizer, offering the promise of a brighter future for learners in even the most remote corners of the globe.

D. Ethical Concerns and Data Privacy

The interviews with English teachers uncovered a critical theme—while acknowledging the benefits of AI in language education, the teachers (84%, n=15) expressed legitimate concerns regarding ethical considerations and data privacy. The deployment of AI in the educational landscape has raised complex ethical questions that demand thoughtful examination and clear guidelines.

Teacher A voiced a common sentiment, stating, "We must strike a balance between personalized learning and respecting students' privacy. AI collects a lot of data, and it's vital that we safeguard that information. “This concern resonates with educators who are acutely aware of the sensitive nature of student data.

Teacher O added, "Students have started asking questions about how their data is being used. We need transparent policies and ethical practices in place to address these concerns." The importance of transparency in AI-driven language education is paramount, as it fosters trust among students and their families.

Moreover, Teacher E emphasized, "Bias in AI is a significant ethical concern. We need to ensure that AI tools are fair and don't perpetuate stereotypes or discriminate against certain groups of students." This concern highlights the need for ongoing scrutiny of AI algorithms to prevent unintended biases.

The consensus among teachers is that ethical considerations and data privacy concerns are integral to the responsible integration of AI in education. Teacher B noted, "We have a responsibility to protect our students' data and ensure that AI is used ethically. This includes clear policies, informed consent, and ongoing oversight".

Teacher J underscored the importance of education on these matters, stating, "We need to educate students about data privacy and ethics in the digital age. It's an essential part of their digital literacy".

These remarks collectively highlight the critical need for ethical AI development and usage in education. As AI continues to evolve, teachers emphasize the importance of ongoing dialogue, policy development, and transparency to ensure that the benefits of AI are harnessed while mitigating potential risks.

In an era where technology plays an ever-expanding role in education, ethical considerations and data privacy must remain at the forefront of discussions. By addressing these concerns thoughtfully and proactively, educators can ensure that AI contributes positively to language education without compromising the trust and privacy of their students.

E. Engagement and Motivation

AI platforms and tools afford to enhance student engagement and motivation in language learning. The teachers (90%, n=?) praised AI-driven language learning tools for their ability to transform the learning experience, making it more interactive, dynamic, and ultimately more captivating.

Teacher A eloquently summed up this theme, stating, "AI makes learning come alive. Interactive exercises, real-time feedback, and gamification elements create an engaging environment that students can't resist." This emphasis on interactivity reflects the important role that AI plays in reshaping language education into a more immersive and motivating experience.

Teacher N provided a firsthand account, sharing,

"Students become more proactive in their learning when they see immediate results and receive constructive feedback from AI. It's like having a learning partner who's always there".

This concept of AI as a constant and supportive learning companion underlines its ability to bolster students' motivation by providing them with timely and meaningful feedback.

Teacher F emphasized how AI's adaptability fuels motivation, stating,

"AI keeps students challenged at their level. It's not about making things too easy or too hard—it's about striking the right balance to keep them motivated to progress".

This adaptability is particularly crucial in maintaining students' enthusiasm for language learning.

Furthermore, Teacher R highlighted the impact of gamification, noting,

"Gamified elements, like rewards and badges, turn learning into a fun and competitive journey. Students strive to excel, not just because they have to, but because they want to".

Gamification strategies embedded within AI-driven platforms foster healthy competition and a sense of achievement.

The overarching sentiment among teachers is that AI transforms language learning from a passive endeavor into an active and engaging experience. Teacher E encapsulated this transformation, stating, "AI taps into students' curiosity and keeps them coming back for more. Learning becomes not just a requirement but a genuine pursuit".

These remarks underscore how AI-driven language learning tools have the potential to reignite students' passion for learning, instilling a sense of ownership and enthusiasm that transcends traditional pedagogical boundaries. As AI continues to evolve, its capacity to sustain and amplify student engagement and motivation stands as a testament to its transformative influence on language education.

F. Professional Development for Educators

This theme revolves around how AI is not only transforming the learning experience for students but also redefining the professional development opportunities available to teachers.

Teacher B aptly noted,

"AI is not just a tool for students; it's a resource for educators as well. It streamlines lesson planning, offers data-driven insights, and provides continuous support for our growth".

This sentiment encapsulates how AI is augmenting teachers' roles, empowering them with AI-assisted tools to enhance their teaching practices.

Teacher D provided a practical perspective, stating,

"AI-driven analytics help us understand how our students are progressing and where they need additional support. This data-driven approach informs our instructional decisions and helps us become more effective educators".

AI serves as a valuable partner in educators' ongoing professional development, offering insights that facilitate data-informed decision-making.

Teacher F emphasized the transformative potential of AI in teacher training, stating, "Professional development is no longer limited to workshops and seminars. AI offers personalized training modules that cater to our individual needs, helping us stay updated with the latest teaching methodologies and technology".

This aspect highlights AI's capacity to foster continuous growth among educators.

Teacher M shared insights into the evolving dynamics between teachers and AI, noting, "We're no longer just instructors; we're facilitators of personalized learning journeys. AI enables us to support each student's unique path to success." This shift toward a more facilitative role underscores how AI is reshaping teachers' roles in the classroom.

Teacher Q echoed the importance of educators' adaptability, stating, "We need to embrace AI as a tool for our professional development. It opens up new possibilities and challenges us to stay innovative and responsive to students' changing needs".

These remarks collectively emphasize how AI is ushering in a new era of professional development for educators, one marked by personalized training, data-driven insights, and a more facilitative approach to teaching. As AI continues to advance, it holds the promise of supporting educators in their quest to provide the best possible learning experiences for their students.

G. Student-Centered Learning

This theme centers on how AI-powered language learning tools are facilitating a shift towards student-centered learning, empowering learners to play a more active role in their language education.

Teacher C aptly noted, "AI has put the learning journey in the hands of students. They can set their pace, explore their interests, and truly own their learning process." This shift embodies the essence of student-centered learning, where learners take the reins of their education.

Teacher G shared an insightful perspective, stating,

"With AI, students can explore topics that genuinely interest them. It's not just about following a prescribed curriculum; it's about nurturing curiosity and fostering independent exploration".

AI's ability to adapt to individual interests and provide personalized content aligns with the principles of student-centered education.

Moreover, Teacher N emphasized how AI promotes differentiation and inclusivity, stating, "Student-centered learning means catering to diverse needs. AI allows us to provide customized support for every student, regardless of their learning style or pace." This inclusivity is a cornerstone of student-centered approaches.

Teacher H highlighted the positive impact on student agency, stating,

"Students are actively making choices about their learning path. They feel a sense of ownership over their education, which translates into higher engagement and motivation".

AI encourages students to become architects of their learning journey.

Teacher J underscored the broader implications of student-centered learning, stating,

"This approach not only fosters language proficiency but also nurtures critical thinking, problem-solving, and lifelong learning skills which are essential competencies for the 21st century".

These remarks collectively emphasize how AI-powered language learning tools are reshaping language education into a more student-centric experience. As educators facilitate this transition, they are witnessing students embrace their roles as active, curious, and independent learners. In an educational landscape that increasingly values personalized and student-driven learning, AI stands as a catalyst for fostering a deeper sense of ownership and empowerment among learners.

V. Discussion

At the heart of this discussion lies the United Nations Sustainable Development Goals (SDGs), a global blueprint for a better and more sustainable future (Haleem et al., 2022). Among these goals, Quality Education (SDG 4) stands as a beacon, highlighting the fundamental role of education in fostering human development, reducing inequalities, and promoting sustainable societies. The pursuit of these goals necessitates innovative approaches to education, and AI offers a promising avenue for progress.

The insights gained from the semi-structured interviews with English language teachers underscore the transformative potential of AI in language education. Teachers consistently praised AI for its capacity to provide highly personalized learning experiences, fostering a deeper sense of engagement and motivation (Shemshack et al., 2021; Kamalov et al., 2023). This aligns with the principles of student-centered learning, resonating with Sustainable Development Goal 4 (Quality Education), which emphasizes the importance of individualized learning to enhance educational outcomes (Vinuesa et al., 2020; Kamalov et al., 2023).

Similarly, the impact of AI on learning outcomes is evident in the enhanced proficiency of students across various language skills (Bilad et al., 2021). Through interactive exercises, instant feedback, and adaptive content, AI empowers students to improve their speaking, listening, reading, and writing abilities (Biletska et al., 2021). The findings here align with Shemshack et al. (2021) and Xu et al. (2023).

In the same vein, AI's role in enhancing student engagement and motivation is undeniable (Xu et al., 2023). Interactive exercises, real-time feedback, and gamification elements make language learning an enjoyable and rewarding experience (Shemshack et al., 2021). These strategies resonate with the principles of effective pedagogy and contribute to SDG 4 by fostering a positive learning environment that keeps students actively engaged in their education. The findings here align with Shemshack et al. (2021) and Xu et al. (2023).

One of the most promising aspects of AI in language education is its role in reducing educational inequalities (Vinuesa et al., 2020). By transcending geographical barriers and providing access to quality language instruction in remote or underserved areas (Kamalov et al., 2023), AI contributes to Sustainable Development Goal 10 (Reduced Inequalities). Our findings suggest that AI has the potential to level the educational playing field, ensuring that learners in less privileged regions have access to the same opportunities as their urban counterparts. This finding aligns with Vinuesa et al. (2020) and Kamalov et al. (2023) that AI technologies have the transformative capacity to bridge the educational divide. By breaking down traditional constraints associated with geographic location, AI interventions

facilitate a more inclusive educational landscape. Learners in remote or underserved regions benefit from access to high-quality language education that might otherwise be limited. This aligns with and contributes significantly to Sustainable Development Goal 10 (Reduced Inequalities), emphasizing the power of AI to create more equitable opportunities for education, irrespective of geographic disparities. The integration of AI in language education, as demonstrated by both Vinuesa et al. (2020) and Kamalov et al. (2023), emerges as a promising avenue to foster a more inclusive global educational environment.

AI is not just transforming the student experience; it is also reshaping the role of educators (George & Wooden, 2023). Teachers are benefiting from AI-powered tools that streamline lesson planning, offer data-driven insights, and provide continuous support for their professional growth. This evolution aligns with the need for educators to continually adapt and develop their skills, as emphasized in SDG 4 (Kamalov et al., 2023).

Perhaps one of the most profound shifts facilitated by AI is the move toward student-centered learning. By empowering learners to set their pace, explore their interests, and take ownership of their learning journey, AI aligns with the principles of learner agency and autonomy. This approach resonates with the educational ideals of SDG 4, which calls for a learner-centric approach to education (Wei, 2023; Kamalov et al., 2023).

While AI holds immense promise, it also raises important ethical considerations. Teachers have expressed legitimate concerns about data privacy, bias, and the need for transparency. This is in line with previous findings of Abioye et al. (2021) and Dwivedi et al. (2021) in the sense that addressing these ethical concerns is critical to fostering trust among students and their families. Sustainable Development Goal 4 underscores the importance of ensuring that education respects privacy and upholds ethical standards, making it imperative for educational institutions and AI developers to establish clear policies and practices.

In conclusion, this study provides a comprehensive exploration of the transformative potential of AI in English language learning, revealing its positive impact on personalized education, enhanced proficiency, and equitable access. These findings underscore the significant contribution of AI to the United Nations Sustainable Development Goals, particularly SDG 4 (Quality Education) and SDG 10 (Reduced Inequalities). While AI brings the promise of improved language education, it also highlights the importance of addressing ethical concerns, ensuring that the potential benefits are realized responsibly and inclusively.

VI. Conclusion

This study offers a compelling narrative of how AI is shaping the future of language education. The themes that have emerged from the semi-structured interviews with English language teachers underscore the multifaceted impact of AI, from personalized learning experiences to improved educational outcomes and the bridging of educational gaps. However, it is crucial to navigate the ethical considerations and data privacy concerns that accompany this transformation. As AI continues to evolve, it holds the promise of fostering greater engagement, motivation, and student agency, while also supporting educators in their professional development.

The findings of this study underscore the significant role of AI in advancing Sustainable Development Goal 4 (Quality Education) and its potential contributions to other SDGs, particularly Reduced Inequalities (SDG 10) and Decent Work and Economic Growth (SDG 8). However, it is crucial to acknowledge the limitations of our study. While our research sheds light on the positive aspects of AI in language education, the scope of our findings may be influenced by the specific characteristics of the sample and the chosen context. Additionally, the dynamic nature of AI development may result in changes that could impact the long-term sustainability and effectiveness of AI-driven language education. As we look ahead, it is essential for educators, policymakers, and AI developers to collaborate in harnessing the benefits of AI in language education while addressing its challenges. The future of language education is undoubtedly shaped by AI, and it is a future that celebrates individuality, inclusivity, and lifelong learning. Further research and collaboration in this field will be instrumental in realizing this vision.

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