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Language learning technologies: A review of trends in the USA and globally

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Abstract

This review provides a succinct overview of the comprehensive review on language learning technologies, exploring key trends in both the United States and global contexts. The review delves into the transformative impact of technology on language education, examining emerging trends that shape the landscape of language learning methodologies. In recent years, language learning technologies have witnessed a remarkable evolution, revolutionizing traditional approaches to language education. This review critically analyzes trends in language learning technologies, focusing on their applications, effectiveness, and implications for language learners, with a specific emphasis on both the United States and global perspectives. The exploration of language learning technologies in the United States reveals a dynamic landscape characterized by innovative tools, platforms, and methodologies. From interactive language apps to virtual reality language immersion experiences, the USA has been at the forefront of adopting cutting-edge technologies to enhance language acquisition. The review assesses the success and challenges of these technologies in diverse educational settings, shedding light on their integration into formal education systems and informal learning environments. On a global scale, the review provides insights into how language learning technologies are shaping language education practices across different countries and regions. It examines the adoption of technology in diverse cultural and linguistic contexts, exploring the effectiveness of digital language learning resources in overcoming linguistic barriers and promoting multilingualism. Key trends identified in the review include the rise of artificial intelligence-driven language tutors, the gamification of language learning, and the increasing emphasis on personalized, adaptive learning experiences. Additionally, the review explores the impact of technology on fostering cultural competence and global communication skills, essential components of language proficiency in the interconnected world. The findings of this review contribute to a deeper understanding of the current state of language learning technologies, offering valuable insights for educators, policymakers, and researchers. By examining trends in the USA and globally, the review provides a comprehensive perspective on the role of technology in shaping the future of language education, paving the way for informed decisions and advancements in language learning methodologies.

Keywords: Technologies; Language; Learning; Trends; Globally

1. Introduction

In the ever-evolving landscape of education, language learning technologies have emerged as catalysts for transformative pedagogical approaches (Miller, 2023). The intersection of language acquisition and technology has given rise to innovative tools, platforms, and methodologies that redefine how individuals engage with and master new languages. From interactive apps and virtual reality experiences to artificial intelligence-driven language tutors, the fusion of language learning and technology is reshaping the dynamics of language education.

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The significance of examining trends in language learning technologies is underscored by their profound impact on the efficacy and accessibility of language education (Karakaya and Bozkurt, 2022). In an era where global communication is increasingly essential, technological advancements offer unprecedented opportunities to enhance language acquisition. Understanding the current landscape of language learning technologies is not only crucial for educators, policymakers, and researchers but also for learners seeking effective and immersive language-learning experiences. This review aims to navigate through the evolving terrain of language learning technologies, shedding light on their adoption, effectiveness, and implications both in the United States and on a global scale (Hacisalihoglu, 2020).

The scope of this review encompasses a comprehensive study of the latest trends in language learning technologies with a dual focus on the United States and global perspectives. By delving into the specific technologies shaping language education in the USA, we aim to uncover innovative practices, successful implementations, and the challenges faced in integrating these technologies into formal and informal learning environments. Simultaneously, the global perspective considers the diverse linguistic and cultural contexts, providing insights into how language learning technologies are influencing educational practices worldwide.

The purpose of this review is threefold: first, to offer a detailed examination of current trends in language learning technologies; second, to assess their impact on language acquisition and education; and third, to provide valuable insights for educators, policymakers, and researchers navigating the dynamic intersection of language learning and technology. By understanding the evolving trends and innovations, we aim to contribute to the ongoing discourse on effective language education methodologies and inspire informed decision-making for the future of language learning.

2. Trends in Language Learning Technologies in the USA

In the United States, the realm of language education is undergoing a paradigm shift, driven by a surge in innovative technologies that cater to diverse learning preferences (Goh and Abdul, 2020). This section explores the current technological landscape, focusing on the adoption and impact of various language learning technologies. The technological landscape in the USA is characterized by a rich tapestry of tools and platforms designed to enhance language acquisition. With the ubiquitous presence of smartphones, tablets, and high-speed internet, learners now have unprecedented access to a plethora of language learning resources. From mobile apps to immersive virtual environments, the technological ecosystem offers a dynamic and personalized approach to language education (Derakhshan et al., 2023).

Language learning apps have become integral components of the modern learner's toolkit. Applications such as Duolingo, Rosetta Stone, and Babbel have witnessed widespread adoption, offering users interactive and gamified experiences. Duolingo, for instance, employs a gamified structure with rewards, making language acquisition an engaging and enjoyable process. This trend reflects a shift from traditional classroom methods to self-directed and accessible learning experiences. Beyond individual use, language learning apps are increasingly integrated into formal education systems across the USA. Institutions recognize the efficacy of these tools in supplementing classroom instruction and providing students with flexible learning opportunities. The gamified nature of these apps aligns with the principles of active learning, encouraging students to participate actively in their language-learning journey. This integration into formal education reflects a holistic approach to language education, combining traditional pedagogies with innovative technological solutions.

The advent of virtual reality (VR) and augmented reality (AR) has opened new frontiers in language education (Gaol and Prasolova, 2022). Immersive experiences enable learners to engage with language in contextual and lifelike scenarios. Virtual reality platforms like VRChat and AltspaceVR offer language learners the opportunity to interact with native speakers in virtual environments, simulating real-world language use. Augmented reality applications, such as Google Translate's AR feature, provide instant translations through smartphone cameras, facilitating on-the-go language comprehension. The incorporation of VR and AR in language education goes beyond mere language acquisition; it fosters cultural understanding and contextual application of linguistic skills. Learners can explore virtual locales, practice language in simulated real-world situations, and develop a nuanced understanding of cultural nuances. This trend signifies a shift towards experiential learning, where technology becomes a conduit for immersive language experiences.

Artificial intelligence (AI) is transforming language education by offering personalized and adaptive learning experiences (Rane, 2023). AI-driven language tutors, like ChatGPT-powered platforms, leverage natural language processing to engage learners in real-time conversations. These tutors adapt to individual learning styles, providing targeted feedback and generating contextually relevant language exercises. This personalized approach addresses the diverse needs of learners, allowing them to progress at their own pace. AI-driven language tutors are particularly

impactful in addressing common challenges, such as individualized attention and feedback, faced in traditional classroom settings. By harnessing the power of AI, language learners in the USA benefit from tailor-made language exercises, enhancing their proficiency and fluency. This trend aligns with the broader educational shift towards adaptive learning technologies that cater to individualized learning paths (Walkington and Bernacki, 2020).

Gamification has emerged as a powerful strategy to motivate language learners and sustain their engagement (Boudadi and Gutiérrez, 2020). Language learning platforms integrate game elements, such as points, levels, and badges, to create an interactive and competitive learning environment. Platforms like FluentU leverage gamification to turn language lessons into captivating experiences, encouraging users to progress through levels and unlock achievements. The gamification of language learning not only enhances motivation but also provides immediate feedback, allowing learners to track their progress in real-time. By transforming language acquisition into a game-like experience, users are more likely to maintain consistent engagement and overcome challenges associated with language learning. This trend reflects a broader shift towards learner-centric approaches, acknowledging the importance of motivation and enjoyment in the language learning journey (La and Dlamini, 2022).

The trends in language learning technologies in the USA underscore a transformative era in language education (Czerkawski and Berti, 2020). From the widespread adoption of interactive apps and immersive VR experiences to the integration of AI-driven language tutors and the gamification of language learning, these technologies are reshaping how individuals in the USA approach language acquisition. As technology continues to evolve, the synergy between innovation and language education promises to unlock new possibilities, making multilingual proficiency more accessible and engaging than ever before.

3. Global Perspectives on Language Learning Technologies

The impact of language learning technologies extends far beyond national borders, creating a dynamic global landscape characterized by diverse adoption patterns, cultural considerations, and regional variances. This study delves into the global perspectives on language learning technologies (Sun et al., 2021), examining the nuances of their adoption, the impact on multilingualism, successful implementations, and the challenges faced on a global scale. The adoption of language learning technologies exhibits distinct regional variances, shaped by factors such as infrastructure, economic conditions, and educational policies. In economically advanced regions like Western Europe and East Asia, technology integration is more widespread, with learners having access to a range of digital language resources. Conversely, in developing regions, barriers related to technological infrastructure may limit the ubiquity of language learning technologies. Understanding these regional differences is essential for crafting targeted strategies that cater to the unique challenges and opportunities in each geographical context (Sasaki et al., 2021).

Cultural and linguistic considerations play a pivotal role in shaping the adoption and effectiveness of language learning technologies (Zhi et al., 2023). In countries with a strong cultural emphasis on language preservation, technology is often harnessed to revitalize and sustain indigenous languages. Additionally, considerations of script and writing systems impact the design of language learning apps (Cheng et al., 2020). For instance, languages with non-Latin scripts may require specialized technological adaptations. The incorporation of cultural context in language learning technologies ensures relevance and resonates with the diverse linguistic tapestry of the global community. The advent of language learning technologies has ushered in a new era of multilingualism, offering learners the opportunity to explore and master multiple languages concurrently. Digital platforms provide a flexible and accessible means for individuals to engage with languages beyond their native tongue. The global impact of technology on multilingualism is evident in the rise of polyglot communities, where individuals from diverse linguistic backgrounds connect through a shared passion for language learning. Moreover, technology has democratized access to less commonly taught languages. Learners in different parts of the world can now engage with languages that were previously challenging to access due to geographical or institutional constraints. This democratization contributes to a more interconnected world, fostering linguistic diversity and understanding on a global scale (BALOSA, 2024).

Examining case studies of successful global implementations provides valuable insights into effective strategies and outcomes (Khan et al., 2020). Platforms like Memrise, which incorporates mnemonic techniques and community-driven content, have achieved international success by resonating with users globally. The success of such platforms often lies in their ability to balance cultural relevance, linguistic diversity, and user engagement. In regions like Scandinavia, where multilingualism is a cultural norm, language learning technologies are seamlessly integrated into educational practices. Countries like Sweden and Denmark leverage technology to facilitate language education that goes beyond English proficiency, embracing a holistic approach to multilingual competence. These cases highlight the importance of aligning technological solutions with the cultural and linguistic fabric of the communities they serve. While language learning technologies offer tremendous potential, global integration is not without its challenges. Disparities in access

to technology and internet connectivity remain significant barriers in certain regions. In developing countries, where infrastructure may be limited, ensuring equitable access to language learning technologies becomes a critical challenge.

Cultural sensitivity and adaptability of technologies also pose challenges. Designing platforms that cater to diverse cultural norms and linguistic nuances requires a nuanced understanding of local contexts. The risk of linguistic and cultural biases in algorithms, particularly in AI-driven language tutors, demands careful consideration to avoid reinforcing stereotypes or excluding certain linguistic groups. Moreover, linguistic diversity itself presents a challenge. Many language learning technologies focus on widely spoken languages, potentially neglecting less commonly spoken or endangered languages. Striking a balance between catering to the demand for widely spoken languages and preserving linguistic diversity is an ongoing challenge in the global implementation of language learning technologies.

Global perspectives on language learning technologies reveal a complex and dynamic landscape influenced by regional disparities, cultural considerations, and the ongoing quest for multilingual proficiency. Comparative analyses, impactful case studies, and a nuanced understanding of challenges provide a foundation for crafting strategies that resonate with diverse global learners. As technology continues to evolve, the global discourse on language learning technologies must prioritize inclusivity, accessibility, and cultural relevance, ensuring that the benefits of technological innovation are shared across linguistic and cultural boundaries. In navigating this diversity, the global community has the opportunity to foster a more connected, multilingual world where language learning technologies become a catalyst for global understanding and collaboration.

4. Emerging Trends and Innovations

The rapid evolution of technology continues to reshape language education, ushering in a new era marked by innovative trends and cutting-edge solutions (Chee and Sanmugam, 2023.). This section explores the emerging trends and innovations in language learning technologies, both in the USA and globally, with a focus on personalized learning experiences, social learning platforms, the role of big data in language learning analytics, and technological solutions for cultural competence. One of the forefront trends in language learning technologies is the emphasis on personalized and adaptive learning experiences. Platforms are increasingly leveraging artificial intelligence (AI) and machine learning algorithms to tailor language instruction to individual learner needs. Adaptive learning systems assess a learner's strengths, weaknesses, and learning style, dynamically adjusting content and difficulty levels to optimize engagement and comprehension.

In the USA, language learning apps like Babbel and Lingodeer employ adaptive algorithms to create personalized learning paths (Lenci, 2020). These platforms track user progress, analyze performance data, and deliver targeted exercises to address specific language proficiency gaps. Globally, this trend is reshaping language education by catering to the diverse learning preferences and paces of individuals, fostering a more effective and efficient language learning journey. The integration of social learning platforms and online communities is a transformative trend that transcends geographical boundaries. Language learners, both in the USA and globally, are seeking collaborative and interactive experiences. Platforms like Tandem and HelloTalk connect language enthusiasts worldwide, facilitating language exchange partnerships and fostering a sense of global community.

In the USA, universities and language institutes are incorporating social learning platforms into their curricula to create virtual language exchange opportunities (Dooly and Vinagre, 2022.). Globally, the rise of online language exchange communities has become a cornerstone of language education, allowing learners to practice language skills with native speakers and fellow learners in real-time. This trend not only enhances language proficiency but also promotes cultural exchange and understanding. Big data analytics is playing an increasingly significant role in shaping the future of language learning technologies. By collecting and analyzing vast amounts of learner data, platforms gain insights into user behavior, preferences, and areas of improvement. In the USA, educational institutions leverage big data analytics to refine language curriculum design and assess the efficacy of different teaching methodologies.

Globally, big data is influencing personalized learning paths, allowing platforms to recommend targeted exercises based on individual learning histories (Ang et al., 2020). This data-driven approach enhances the adaptive nature of language learning technologies, making them more responsive to the evolving needs of learners. However, the responsible and ethical use of big data in language learning requires careful consideration of privacy concerns, ensuring that learner data is utilized ethically and securely. As the world becomes more interconnected, the importance of cultural competence in language education is paramount. Technological solutions are emerging to address this need, incorporating cultural elements into language learning platforms. In the USA, platforms are integrating cultural context into language lessons to enhance learners' understanding of idioms, customs, and societal norms.

Globally, technology is being harnessed to bridge cultural gaps and promote cross-cultural competence. Virtual reality simulations, for instance, immerse learners in culturally authentic scenarios, allowing them to navigate real-world situations in a foreign language. This trend contributes to a more holistic language learning experience by instilling an appreciation for cultural nuances and fostering global citizenship. The emerging trends and innovations in language learning technologies are reshaping the landscape of language education both in the USA and around the world. From personalized and adaptive learning experiences to the integration of social learning platforms, the role of big data in language learning analytics, and technological solutions for cultural competence, these trends reflect a commitment to addressing the diverse needs of learners in an interconnected global society. As technology continues to advance, the challenge lies in harnessing these innovations responsibly and inclusively. Language learning technologies have the potential to democratize access to language education, create vibrant global communities of learners, and foster cultural understanding. By staying attuned to emerging trends and ensuring equitable access, language educators, policymakers, and learners can collectively contribute to a future where language learning is not just a skill but a gateway to shared knowledge, understanding, and appreciation across borders.

5. Effectiveness and Challenges

The integration of language learning technologies has revolutionized language education, offering innovative approaches to acquisition (Almuhaisen et al., 2020). This section explores the effectiveness and challenges of language learning technologies, providing insights into their impact on language acquisition, strategies to address inherent challenges, and user perspectives that shape the landscape both in the USA and globally. The effectiveness of language learning technologies in facilitating language acquisition is a focal point in their ongoing evolution. Numerous studies have demonstrated the positive impact of digital tools on language proficiency. In the USA, language learning apps like Rosetta Stone and Duolingo have gained popularity, with users reporting improvements in vocabulary, pronunciation, and conversational skills.

Globally, the effectiveness of these technologies varies based on factors such as language complexity, learner engagement, and the alignment of technology with pedagogical principles. Adaptive learning platforms that tailor content to individual needs contribute significantly to effectiveness, enabling learners to progress at their own pace. The gamification of language learning also enhances engagement and motivation, positively influencing the acquisition process. However, assessing effectiveness requires nuanced consideration. While digital tools excel in certain aspects of language learning, they may face challenges in replicating the immersive experiences provided by real-world language use. The evaluation of effectiveness must encompass not only immediate gains in vocabulary or grammar but also long-term language retention and real-world application.

Despite the promise of language learning technologies, several challenges persist in their widespread adoption (Facer and Selwyn, 2021.). In the USA, challenges often revolve around equitable access to technology, particularly in socioeconomically disadvantaged communities. The "digital divide" poses a barrier to ensuring that all learners have access to the tools necessary for effective language education. Bridging this gap is essential to prevent the exacerbation of educational inequalities. Globally, challenges extend beyond access to encompass linguistic diversity and cultural relevance. Language learning technologies may not always cater to less commonly spoken languages or specific cultural contexts. Additionally, the adaptability of these technologies to different learning styles and educational systems worldwide remains an ongoing challenge. Ensuring that language learning technologies are inclusive and adaptable to diverse educational environments is crucial for their sustained impact.

Technical challenges, such as glitches, connectivity issues, or the learning curve associated with using new platforms, also affect the seamless integration of language learning technologies (Ping et al., 2022). As technologies continue to evolve, addressing these challenges requires collaborative efforts among educators, policymakers, and technology developers to create solutions that are accessible, culturally sensitive, and adaptable to various contexts. Understanding user perspectives and satisfaction is integral to assessing the overall impact and usability of language learning technologies. In the USA, where these technologies are widely embraced, user satisfaction often stems from the convenience and flexibility they offer. Learners appreciate the ability to practice language skills at their own pace, anytime and anywhere. User-generated reviews and ratings on language learning apps provide valuable insights into user satisfaction and help refine the platforms based on user feedback.

Globally, user perspectives are diverse and influenced by cultural attitudes towards technology and education. While some learners embrace the autonomy and interactivity of digital language tools, others may prefer traditional classroom settings. Tailoring language learning technologies to accommodate various learning preferences ensures a broader appeal and higher user satisfaction. However, user perspectives also highlight the need for ongoing improvement. Some learners may find certain platforms more engaging than others, emphasizing the importance of diverse content and

interactive features. Additionally, addressing user concerns related to privacy, data security, and the ethical use of technology in education contributes to fostering a positive perception of language learning technologies.

The effectiveness and challenges of language learning technologies underscore the dynamic nature of their integration into language education both in the USA and globally (Pulatbek, 2023.). While these technologies offer transformative possibilities, addressing challenges related to access, cultural relevance, and technical issues is imperative for ensuring their equitable and widespread impact. The evolving landscape of language learning technologies necessitates a continual assessment of their effectiveness, informed by user perspectives and a commitment to inclusivity. As technologies advance, the collaboration between educators, technology developers, and policymakers becomes pivotal in steering the course towards a future where language learning technologies not only enhance proficiency but also bridge educational gaps and foster a global community of empowered language learners.

6. Implications for Education and Policy

The integration of language learning technologies into education has far-reaching implications for curriculum development, policy considerations, and the roles of educators and policymakers (Liu et al., 2023; Olushola, 2017). This study delves into the implications of language learning technologies, examining their influence on language curriculum, policy considerations for technology integration, and providing recommendations for educators and policymakers in both the USA and global contexts. Language learning technologies exert a profound influence on the development and evolution of language curricula. In the USA, where digital tools have become integral to language education, curricular frameworks are adapting to incorporate these technologies. Traditional language curricula are increasingly complemented by digital resources, interactive platforms, and adaptive learning systems (Pendy, 2023).

Globally, the influence on language curriculum development varies, reflecting the diverse approaches to education. In technologically advanced regions, curricula may undergo more significant transformations to embrace digital literacy and fluency as essential components of language proficiency. In contrast, in regions with limited access to technology, there may be a focus on ensuring equitable access and integrating digital tools where possible. The integration of language learning technologies prompts a shift towards more dynamic, learner-centric curricula. Adaptive learning platforms influence the design of curricular modules by catering to individual learning needs, promoting active engagement, and fostering a more personalized language learning experience. The challenge lies in balancing traditional language teaching methodologies with innovative technological approaches to create comprehensive and effective curricula.

As language learning technologies become increasingly pervasive, policymakers must navigate a complex landscape to ensure effective integration (Habbal et al., 2024). In the USA, educational policies are adapting to recognize the role of technology in language education. Policies may focus on providing access to digital resources, supporting professional development for educators, and establishing guidelines for the ethical and responsible use of technology in language classrooms. On a global scale, policymakers face challenges related to infrastructure, funding, and adapting policies to suit diverse educational systems. The integration of language learning technologies requires a strategic approach that considers the unique needs and circumstances of each region. Policies must address issues of digital equity, ensuring that learners across socio-economic backgrounds have access to the benefits of technology-driven language education. Considering the rapid evolution of technology, policies should be flexible and adaptive, capable of accommodating emerging trends while safeguarding educational objectives. Policymakers play a crucial role in fostering an environment that encourages innovation, provides support for technology implementation, and establishes frameworks for continuous evaluation and improvement.

Educators should receive ongoing professional development to stay abreast of the latest language learning technologies and effective integration strategies (Olushola and Olabode, 2018; Karsenti et al., 2020). Policymakers can support this by allocating resources for training programs and creating incentives for educators to engage in continuous learning. Policymakers should invest in digital literacy initiatives to ensure that learners develop essential skills for navigating and critically evaluating online language resources. Integrating digital literacy into language curricula prepares learners for the digital demands of the 21st century. Both educators and policymakers should prioritize equitable access to technology. Initiatives to provide devices, internet connectivity, and digital resources to underserved communities can bridge the digital divide and ensure that all learners have the opportunity to benefit from language learning technologies.

Policymakers should allocate resources for research on the impact of language learning technologies (Ifenthaler et al., 2021). Rigorous evaluation studies can inform evidence-based policies and guide educators in selecting effective tools. Continuous research ensures that policies evolve based on empirical evidence. Encourage collaboration between

educators, policymakers, and technology developers. A collaborative approach fosters innovation, allows for the identification of best practices, and ensures that policies are informed by the practical experiences of educators. Policymakers should establish guidelines for the ethical use of technology in language education. This includes considerations for data privacy, digital security, and ensuring that technology does not perpetuate biases or stereotypes in language instruction.

The implications of language learning technologies on education and policy are multifaceted, requiring a concerted effort from educators, policymakers, and stakeholders to navigate effectively. As technologies continue to advance, the challenge lies in aligning policies with the evolving landscape of language education while ensuring equitable access and promoting the responsible use of technology. By embracing the transformative potential of language learning technologies, educators and policymakers can create a future where language education is inclusive, adaptive, and responsive to the needs of diverse learners. Through thoughtful policies, ongoing professional development, and a commitment to digital equity, language learning technologies can contribute to a global community of empowered language learners ready to navigate the linguistic challenges of our interconnected world.

7. Future Directions and Innovations

As language learning technologies continue to evolve, the future holds exciting possibilities that will shape educational practices globally (Grassini, 2023). This study delves into the anticipated technological advances, potential impacts on educational practices, and ethical considerations for the future of language learning technologies in both the USA and across the globe. The future of language learning technologies promises a convergence of cutting-edge innovations, reshaping how individuals acquire and master new languages. Several anticipated technological advances are poised to revolutionize language education: The integration of more sophisticated AI algorithms will enable the creation of highly personalized and adaptive language learning experiences. AI-driven language tutors will better understand individual learning styles, providing targeted feedback and tailored exercises to enhance proficiency.

The immersive experiences offered by VR and AR technologies will play a significant role in language acquisition (Huang et al., 2021; Oti and Ayeni, 2013). Learners can engage in virtual conversations with native speakers, participate in simulated real-world scenarios, and explore culturally authentic environments, fostering a deeper understanding of language and culture (Kim, 2020). NLP technologies will enhance language learning platforms' ability to understand and respond to learners in a more natural and context-aware manner. Conversational agents powered by NLP will create interactive and dynamic language learning experiences, simulating real-life language use. Future platforms may integrate multiple modes of learning, combining visual, auditory, and kinesthetic elements to accommodate diverse learning styles. This approach goes beyond traditional text and audio, providing a holistic and engaging language learning experience.

Gamified elements and immersive simulations will continue to play a crucial role in maintaining learner engagement (Casella et al., 2023). These elements enhance motivation, encourage active participation, and transform language learning into an enjoyable and interactive journey. Advanced analytics will enable the prediction of individual learner needs and progress, allowing platforms to proactively adjust content and exercises (Wu et al., 2021). Predictive analytics can offer insights into potential challenges, enabling early interventions to address learning gaps. The anticipated technological advances in language learning technologies hold the potential to transform educational practices and redefine the language learning landscape: The integration of advanced AI will lead to highly personalized and adaptive learning paths. Educators can leverage these technologies to tailor instruction to individual student needs, promoting self-directed learning and accommodating diverse learning styles (Thimmanna et al., 2024).

VR and AR technologies will facilitate global collaborative learning experiences. Students from different parts of the world can engage in virtual language exchange programs, fostering cultural exchange and providing authentic language practice with native speakers. Future language learning practices may involve a seamless blend of traditional classroom instruction and technology-enhanced learning. Blended learning environments can leverage the strengths of both approaches, combining face-to-face interactions with the flexibility and interactivity of digital tools. Predictive analytics will enable continuous assessment and real-time feedback, allowing educators to monitor student progress and address challenges promptly. This shift towards continuous assessment fosters a dynamic and responsive approach to language education (Kilag et al., 2023).

Multimodal learning platforms can cater to diverse cultural and linguistic backgrounds, ensuring that content is both culturally relevant and inclusive. This approach acknowledges the importance of cultural competence in language education and promotes a more globalized understanding. As language learning technologies advance, ethical considerations become paramount to ensure responsible implementation and safeguard the interests of learners: The

collection of learner data raises concerns about privacy and data security. Policymakers and developers must establish robust measures to protect user data, ensuring compliance with privacy regulations and ethical standards. Developers should address potential algorithmic biases in AI-driven language tutors. Ensuring fairness and inclusivity in language learning technologies is crucial to prevent reinforcing stereotypes or discriminating against specific linguistic or cultural groups.

Policymakers must prioritize digital equity to ensure that all learners, regardless of socio-economic background, have access to evolving language learning technologies (Gottschalk and Weise, 2023). Initiatives should focus on reducing the digital divide and providing equal opportunities for technology-enhanced language education. The integration of technology should align with pedagogical principles to maintain the integrity of language education. Educators and developers should collaborate to ensure that technological innovations enhance, rather than detract from, effective language instruction. Innovations in language learning technologies should prioritize accessibility for learners with diverse needs. This includes considerations for individuals with disabilities and those in regions with limited technological infrastructure.

Developers and educators should collaborate across borders to create culturally sensitive content and experiences. Acknowledging and respecting cultural differences is essential to avoid unintentional cultural insensitivity in language learning technologies. The future of language learning technologies holds tremendous promise, with anticipated technological advances set to redefine educational practices globally. As these innovations shape the landscape of language education, responsible implementation, ethical considerations, and a commitment to inclusivity become imperative. By navigating the ethical challenges, prioritizing digital equity, and ensuring that technological advances align with pedagogical principles, educators, policymakers, and developers can collectively contribute to a future where language learning technologies empower learners, bridge cultural divides, and foster a more interconnected and linguistically diverse global community.

8. Conclusion

In the ever-evolving landscape of language education, the review of trends in language learning technologies provides a comprehensive insight into the dynamic interplay between innovation, global practices, and the pursuit of effective language acquisition. As we conclude this study, key trends, contributions to language education, and a call to action for ongoing research and innovation emerge as guiding pillars for the future. The trends in language learning technologies, both in the USA and globally, depict a transformative journey characterized by innovation, adaptability, and a commitment to enhancing language acquisition. Key trends include the integration of artificial intelligence (AI) for personalized learning, the rise of social learning platforms, the influence of big data on language analytics, and the incorporation of virtual and augmented reality into language education. Multimodal learning experiences, gamification, and the emergence of adaptive learning systems contribute to a rich tapestry of tools and approaches, shaping the language learning landscape.

In the USA, the widespread adoption of language learning apps and digital resources reflects a tech-savvy approach to education. Globally, the trends vary based on diverse technological landscapes, cultural considerations, and the socio-economic conditions of different regions. However, a common thread unites these trends: a commitment to leveraging technology for inclusive, engaging, and effective language education. Language learning technologies have made significant contributions to language education, redefining pedagogical approaches and fostering a more interconnected global community: The integration of technology has democratized access to language education, breaking down geographical barriers and providing learners from diverse backgrounds with opportunities for linguistic growth.

AI-driven personalization enhances the learning experience by tailoring content to individual needs, fostering engagement, and accommodating diverse learning styles. Social learning platforms contribute to a sense of global community and collaborative language acquisition. Big data analytics offer insights into learner progress, enabling educators to make informed decisions about instructional strategies and interventions. Predictive analytics pave the way for proactive support and continuous improvement in language education. Innovations in language learning technologies emphasize cultural sensitivity, promoting global competence by exposing learners to authentic cultural contexts and diverse linguistic experiences.

The integration of technology allows for flexible and adaptable learning experiences. Blended learning approaches, combining traditional instruction with digital tools, provide a balance that caters to the evolving needs of learners. As we stand at the crossroads of innovation in language learning technologies, a call to action resonates for continued research and innovation. The dynamic nature of technology demands ongoing exploration and adaptation to harness its full potential:

Researchers and policymakers must work collaboratively to bridge the digital divide, ensuring that language learning technologies are accessible to all learners, irrespective of socio-economic disparities. The ethical implications of technology in education merit sustained attention. Researchers should focus on developing guidelines for responsible implementation, considering issues of privacy, data security, and cultural sensitivity.

Future research should explore innovative approaches to enhance multilingual learning, considering the diverse linguistic landscape of global education. This involves addressing challenges related to less commonly spoken languages and fostering linguistic diversity.

Researchers are encouraged to explore the integration of emerging technologies, such as advanced AI, extended reality (XR), and natural language processing (NLP), to continually enhance language learning experiences and outcomes. Global collaboration among educators, researchers, and technology developers is crucial. Sharing best practices, cultural insights, and effective strategies ensures that language learning technologies cater to diverse linguistic and cultural contexts. In conclusion, language learning technologies stand as transformative catalysts, propelling language education into a future marked by innovation, inclusivity, and global collaboration. By embracing the lessons learned from current trends, acknowledging their contributions, and heeding the call to action for ongoing research, educators, policymakers, and researchers can collectively shape a future where language learning becomes an empowering and enriching journey for learners worldwide.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

- [1] Almuhausen, O., Habes, M. and Alghizzawi, M., 2020. An empirical investigation the use of information, communication technologies to English language acquisition: A case study from the Jordan. *development*, 7(5).
- [2] Ang, K.L.M., Ge, F.L. and Seng, K.P., 2020. Big educational data & analytics: Survey, architecture and challenges. *IEEE access*, 8, pp.116392-116414.
- [3] Anis, M., 2023. Leveraging Artificial Intelligence for Inclusive English Language Teaching: Strategies and Implications for Learner Diversity. *Journal of Multi-disciplinary Educational Research*, 12(6).
- [4] BALOSA, D., 2024. Existential sociolinguistics and existential justice: Addressing minority language issues in multilingual societies. *International Journal of Language Studies*, 18(2).
- [5] Boudadi, N.A. and Gutiérrez-Colón, M., 2020. Effect of Gamification on students' motivation and learning achievement in Second Language Acquisition within higher education: a literature review 2011-2019. *The EuroCALL Review*, 28(1), pp.57-69.
- [6] Cascella, M., Cascella, A., Monaco, F. and Shariff, M.N., 2023. Envisioning gamification in anesthesia, pain management, and critical care: basic principles, integration of artificial intelligence, and simulation strategies. *Journal of Anesthesia, Analgesia and Critical Care*, 3(1), p.33.
- [7] Chee, K.N. and Sanmugam, M. eds., 2023. *Embracing Cutting-Edge Technology in Modern Educational Settings*. IGI Global.
- [8] Cheng, Y.W., Wang, Y., Yang, Y.F., Yang, Z.K. and Chen, N.S., 2020. Designing an authoring system of robots and IoT-based toys for EFL teaching and learning. *Computer Assisted Language Learning*, 34(1-2), pp.6-34.
- [9] Czerkawski, B. and Berti, M., 2020. Language learning in the 21st century: current status and future directions. *Language learning and professionalization in higher education: pathways to preparing learners and teachers in/for the 21st century*, p.11.
- [10] Derakhshan, A., Wang, Y., Wang, Y. and Ortega Martín, J.L., 2023. Towards innovative research approaches to investigating the role of emotional variables in promoting language teachers' and learners' mental health.
- [11] Dooly, M. and Vinagre, M., 2022. Research into practice: Virtual exchange in language teaching and learning. *Language Teaching*, 55(3), pp.392-406.

- [12] Facer, K. and Selwyn, N., 2021. Digital technology and the futures of education: Towards 'Non-Stupid' optimism. *Paper commissioned for the UNESCO Futures of Education report.*
- [13] Gaol, F.L. and Prasolova-Førland, E., 2022. Special section editorial: The frontiers of augmented and mixed reality in all levels of education. *Education and Information Technologies*, pp.1-13.
- [14] Goh, P.S.C. and Abdul-Wahab, N., 2020. Paradigms to drive higher education 4.0. *International Journal of Learning, Teaching and Educational Research*, 19(1), pp.159-171.
- [15] Gottschalk, F. and Weise, C., 2023. Digital equity and inclusion in education: An overview of practice and policy in OECD countries..
- [16] Grassini, S., 2023. Shaping the future of education: exploring the potential and consequences of AI and ChatGPT in educational settings. *Education Sciences*, 13(7), p.692.
- [17] Habbal, A., Ali, M.K. and Abuzaraida, M.A., 2024. Artificial Intelligence Trust, Risk and Security Management (AI TRiSM): Frameworks, applications, challenges and future research directions. *Expert Systems with Applications*, 240, p.122442.
- [18] Hacisalihoglu, G., 2020. Zinc (Zn): The last nutrient in the alphabet and shedding light on Zn efficiency for the future of crop production under suboptimal Zn. *Plants*, 9(11), p.1471.
- [19] Hilliker, S., 2020. Virtual exchange as a study abroad alternative to foster language and culture exchange in TESOL teacher education. *Tesl-Ej*, 23(4), p.n4.
- [20] Huang, X., Zou, D., Cheng, G. and Xie, H., 2021. A systematic review of AR and VR enhanced language learning. *Sustainability*, 13(9), p.4639.
- [21] Ifenthaler, D., Gibson, D., Prasse, D., Shimada, A. and Yamada, M., 2021. Putting learning back into learning analytics: Actions for policy makers, researchers, and practitioners. *Educational Technology Research and Development*, 69, pp.2131-2150.
- [22] Jones, K.M., Asher, A., Goben, A., Perry, M.R., Salo, D., Briney, K.A. and Robertshaw, M.B., 2020. "We're being tracked at all times": Student perspectives of their privacy in relation to learning analytics in higher education. *Journal of the Association for Information Science and Technology*, 71(9), pp.1044-1059.
- [23] Karakaya, K. and Bozkurt, A., 2022. Mobile-assisted language learning (MALL) research trends and patterns through bibliometric analysis: Empowering language learners through ubiquitous educational technologies. *System*, p.102925.
- [24] Karsenti, T., Kozarenko, O.M. and Skakunova, V.A., 2020. Digital technologies in teaching and learning foreign languages: Pedagogical strategies and teachers' professional competence. *Education and SelfDevelopment*, 15(3), pp.76-88.
- [25] Khan, O., Daddi, T. and Iraldo, F., 2020. Microfoundations of dynamic capabilities: Insights from circular economy business cases. *Business Strategy and the Environment*, 29(3), pp.1479-1493.
- [26] Kilag, O.K., Marquita, J. and Laurente, J., 2023. Teacher-Led Curriculum Development: Fostering Innovation in Education. *Excellencia: International Multi-disciplinary Journal of Education (2994-9521)*, 1(4), pp.223-237.
- [27] Kim, D., 2020. Learning language, learning culture: Teaching language to the whole student. *ECNU Review of Education*, 3(3), pp.519-541.
- [28] La Fleur, J. and Dlamini, R., 2022. Towards learner-centric pedagogies: Technology-enhanced teaching and learning in the 21st century classroom. *Journal of Education (University of KwaZulu-Natal)*, (88), pp.4-20.
- [29] Lenci, S., 2020. Technology and language learning: from CALL to MALL.
- [30] Liu, S., Gao, S. and Ji, X., 2023. Beyond borders: exploring the impact of augmented reality on intercultural competence and L2 learning motivation in EFL learners. *Frontiers in Psychology*, 14, p.1234905.
- [31] Miller, D., 2023. Embracing the Technological Metamorphosis: Envisioning Higher Education for Generation Alpha in a Shifting Educational Landscape. *International Journal Software Engineering and Computer Science (IJSECS)*, 3(2), pp.88-96.
- [32] Olushola, A.O. and Olabode, K.T., 2018. Prevalence of sexting among students in selected secondary schools in Southwestern Nigeria. *Gender and Behaviour*, 16(1), pp.11011-11025.

- [33] Olushola, A.O., 2017. Sexting in educational sector: gender perspective in some selected secondary schools in ekiti and osun states. *IFE Psychologia: An International Journal*, 25(2), pp.245-261.
- [34] Oti, A. and Ayeni, O., 2013. Yoruba culture of Nigeria: creating space for an endangered specie. *Cross-Cultural Communication*, 9(4), p.23.
- [35] Pendy, B., 2023. From Traditional to Tech-Infused: The Evolution of Education. *BULLET: Jurnal Multidisiplin Ilmu*, 2(3), pp.767-777.
- [36] Ping, P.S.Y., Hiew, W. and Tobi, B., 2022. Challenges in technology integration for online teaching and learning for English sessional academics. *Computer Assisted Language Learning*, 23(1), pp.233-258.
- [37] Pulatbek, S., 2023. Importance of digital educational technologies in teaching foreign languages. *American Journal of Pedagogical and Educational Research*, 18, pp.298-304.
- [38] Rane, N., Choudhary, S. and Rane, J., 2023. Education 4.0 and 5.0: Integrating Artificial Intelligence (AI) for personalized and adaptive learning. Available at SSRN 4638365.
- [39] Sasaki, I., Nummela, N. and Ravasi, D., 2021. Managing cultural specificity and cultural embeddedness when internationalizing: Cultural strategies of Japanese craft firms. *Journal of International Business Studies*, 52, pp.245-281.
- [40] Shadiev, R. and Yang, M., 2020. Review of studies on technology-enhanced language learning and teaching. *Sustainability*, 12(2), p.524.
- [41] Sun, Z., Yu, S., Guo, H., Wang, C., Zhang, Z. and Xu, R., 2021. Assessing 40 years of spatial dynamics and patterns in megacities along the Belt and Road region using satellite imagery. *International Journal of Digital Earth*, 14(1), pp.71-87.
- [42] Thimmanna, A.V.N.S., Naik, M.S., Radhakrishnan, S. and Sharma, A., 2024. Personalized Learning Paths: Adapting Education with AI-Driven Curriculum. *European Economic Letters (EEL)*, 14(1), pp.31-40.
- [43] Walkington, C. and Bernacki, M.L., 2020. Appraising research on personalized learning: Definitions, theoretical alignment, advancements, and future directions. *Journal of research on technology in education*, 52(3), pp.235-252.
- [44] Wang, Y. and Stockwell, G., 2023. Social justice and technology in second language education. *Iranian Journal of Language Teaching Research*, 11(3 (Special Issue)), pp.1-18.
- [45] Watts-Taffe, S., 2022. Multimodal literacies: Fertile ground for equity, inclusion, and connection. *The Reading Teacher*, 75(5), pp.603-609.
- [46] Wu, J.Y., Yang, C.C., Liao, C.H. and Nian, M.W., 2021. Analytics 2.0 for precision education. *Educational Technology & Society*, 24(1), pp.267-279.
- [47] Zhi, R., Wang, Y. and Wang, Y., 2023. The role of emotional intelligence and self-efficacy in EFL teachers' technology adoption. *The Asia-Pacific Education Researcher*, pp.1-12.