Enhancing English Language Learning Skills by Using Metaverse Technology: An Integrative Literature Review

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ABSTRACT

Technology has been developing in ways that can help students learn better, including how they learn languages such as English. The purpose of this study was to analyze prior research on the use of Metaverse Technology (MvT) in educational settings, focusing on studies centered on English as a Foreign Language (EFL) students, for the purpose of enhancing English Language Learning (ELL) skills and formulating guidelines for instructors in Higher Education Institutions (HEIs). The potential of MvT in EFL is that students can practice the English language inside digital spaces that feel real, such as talking, solving problems, or working on group projects together. They can talk, move, and solve problems inside those spaces instead of only reading or listening in a traditional class. This study utilized an integrative literature review (ILR) approach related to how instructors use MvT to enhance EFL skills among students. Further, the study identified how the integration of MvT could address challenges in engaging students and improving their English Language skill proficiencies. The objective of the study was to identify practical, evidence-based ideas that instructors could use to improve student learning. The process involved completing an integrative literature review, which was screened, compared, and grouped by shared themes. The results of this study contribute to instructional design (ID) research, suggesting practical ways that universities and instructors may incorporate MtVs into EFL in Higher Education.

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GENERAL AUDIENCE ABSTRACT

Although English is the language most often used in school and work around the world, many college students in Saudi Arabia consider it challenging to learn. This study looked at whether a new digital tool called Metaverse Technology (MvT) could make it easier for English as a Foreign Language (EFL) students in Higher Education Institutions (HEIs) to enhance their English Language Learning (ELL) skills. The researcher reviewed multiple articles from the past several years, illuminating how MtVs work and the ways that they are effective in teaching college students EFL. Most studies indicated that MvT helped make students more confident and less anxious when learning ELL skills. Instructors also supported the use of the technology, believing that it allowed EFL students to interact in real-life situations online, which provided students with more chances to use the language in ELL. The studies have also highlighted that an instructor's training remains crucial for ensuring reliability and success. Instructors also need to plan how MvT will be integrated into courses for EFL students, focusing on ELL skills. When used carefully, MvT can give EFL students a stronger voice in the classroom and help them learn through doing, not just through study. For the HEIs trying to meet new goals for ELL, this approach offers a practical and realistic path forward.

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DEDICATION

To my beloved parents, Muneer and Eman

To my beloved siblings, Mazen, Mohamed, and Yara:

Thank you for your support. I dedicate the result of my efforts to your endless love, care, encouragement, and tender hands, which have always helped me achieve my academic goals.

To my lovely children, Jana, Joud, Abdulrahman, and Ahmed:

Thank you for your patience, for making this tough path more doable, and for sharing your experiences with me. You have made it possible.

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Chapter 1
Introduction

English language learning (ELL) is an important part of the curriculum in Saudi Arabia and is routinely taught in addition to the official language of Arabic. Students routinely begin ELL at a very young age; however, this comes with certain difficulties for both instructors and English as a Foreign Language (EFL) students. Problems include the instructors having limited exposure to the English language outside of the classroom, their having limited knowledge on how to use or update the outdated curriculum, and larger class sizes (Aziz & Kashinathan, 2021; Brevik & Rindal, 2020; Islam et al., 2022). Such challenges have led to poor overall English language proficiency within the country (Islam et al., 2022). Studies showed that overall academic reading, vocabulary, comprehension, and writing skills are lacking in EFL student populations (Chicho, 2022; Khadawardi, 2022; Zhang et al., 2021).

Saudi undergraduates studying the English language in English literacy departments often deal with a variety of challenges in ELL skills due to cultural dynamics (Hossain, 2024), a lack of institutional support (Islam et al., 2022), and personal academic skills (Aizawa et al., 2023). Such difficulties further challenge these Saudi students with proficiency in language based on a limited exposure to English, as language fluency may not have been stressed in their previous schooling, and many students arrive at the Higher Education Institutions (HEIs) with little experience speaking and writing in English (Al-Hassaani & Al-Saalmi, 2022). The EFL students also face a lack of interest or motivation and often struggle with pronunciation because of the specific linguistic differences between the Arabic and English languages (Brevik & Rindal, 2020; Islam et al., 2022). Another issue is that many students are over-dependent on digital

translators, which hinders the ability of the EFL student to understand how to structure and improve speaking (Almusharraf & Bailey, 2023).

Solutions introduced to promote improvements in ELL in Saudi Arabian Higher Education Institutions (HEIs) have included prioritizing communicative practice, integrating technology, instructor training programs, and focusing on learner-centered approaches (Brevik & Rindal, 2020). For Saudi undergraduate EFL students, other solutions may include the adoption of a culturally relevant curriculum, utilizing authentic materials, encouraging collaborative learning, and promoting a positive attitude towards speaking the English language. This process could be accomplished by highlighting its related real-world applications and benefits for students' future careers and global engagement. Employers find strong communication skills valuable, maintaining that reflecting an individual's ability to communicate professionally in emails, reports, proposals, and other documents, and language proficiency is desired and required due to its importance for a student's future academic and professional success (Hossain, 2024; Irafahmi et al., 2021; Seçer & Yücel-Toy, 2020; Zahroh et al., 2024).

To determine methods for ELL improvement through education, some experts examined instructors' use of technology resources for EFL students in ELL education (Bin-Hady & Al-Tamimi, 2021; Seyyedrezaei et al., 2024). As technology has rapidly advanced and created changes in education globally (Antoninis et al., 2023), new teaching methods have emerged for instructors in HEIs. Many instructors integrate technology with their teaching practices in the EFL classrooms, providing students with access to diverse multimedia content, enabling personalized learning experiences, facilitating interactive practice, and allowing students to engage with authentic English language materials on a global scale (Biletska et al., 2021).

Using technology in the classroom as a tool for teaching has been shown to enhance student comprehension, support vocabulary building, and improve overall fluency in the target language (Andujar et al., 2020; Klimova & Zamborova, 2020). Instructors use technology to support teaching practices with EFL students and integrate computer networks that facilitate English language teaching and learning. Advances in technology have assisted instructors of ELL in HEIs. For example, technology can be used as part of an active learning approach that can transform students from passive recipients to active learners as they integrate online content (Dzaiy & Abdullah, 2024; Jahnke et al., 2022). Instructors who use technology in ELL also allow students the ability to practice ELL skills while interacting with tools such as video, audio, real-time text, and discussion messaging with speakers who have higher-level proficiency in the English language (Biletska et al., 2021).

Personalized learning using online learning platforms has resulted in positive outcomes that reinforce vocabulary using visual aids through video and online access. Thus, technology assists ELL students in finding their voice while transitioning to the English language. Computer programs also increase motivation for learners, helping students develop vocabulary, reading, comprehension, and writing skills (Zhao & Lai, 2023). Technology such as text-to-speech allows students to hear words, paragraphs, or whole passages read aloud, and such programs can assist students with translation and pronunciation (Jose, 2024). Use of text and picture dictionaries offers students the ability to see the meaning of vocabulary terms (Jose, 2024).

Thus, ELL instructors who use multimedia technology can provide EFL students with contextual cues that allow students to recognize and understand key concepts within the content they are reading. The Saudi Ministry of Education (MOE) focused on integrating advanced technologies into the education system, establishing a knowledge-based economy through Vision

2030 (Al-Mwzaiji & Muhammad, 2023). The Saudi MOE has had considerable influence in promoting these reforms, which encompass the use of technology in the context of EFL students.

However, researchers have found that using technology to enhance learning and instruction has significant challenges (Kim et al., 2023; Nuemaihom, 2024). One concern is the equitable distribution in terms of access to technology and infrastructure that is required for learning. This is a global problem, with not all institutions being capable of having access to technology like high-speed internet or VR/AR glasses (Al-Mwzaiji & Muhammad, 2023). These divisions can overpower existing learning disparities, necessitating the need for governments to develop measures allowing equal use of technology in education. Furthermore, privacy and data protection concerns exist, requiring policy changes to ensure the security of content used for education through specific technological resources (Jose, 2024).

One new tool that has shown significant promise in teaching language has been Metaverse Technology (MvT), which is designed as an online learning space with MvT students who can enter through Virtual Reality (VR), Augmented Reality (AR), and other digital simulations (Singh et al., 2022). In this study, MvT refers to immersive environments that bring together AR, VR, and Artificial Intelligence (AI) to create learning experiences that respond to students' actions in real time. Within these spaces, learners can explore, interact, and apply knowledge in ways that go beyond traditional classroom walls.

MvT has already been used across several industries to build digital versions of real places, such as factories or production lines. Teams can test, train, and solve problems before moving to physical settings. We can apply those same ideas to education. When EFL students work inside a virtual environment that mirrors a classroom or workplace, they can practice language, communication, and critical thinking skills in a setting that feels authentic and

engaging. The same principles that improve efficiency and innovation in industry can also support more active, student-centered learning in HEIs.

In addition, MvT may be a valuable learning tool and provide a unique environment to boost EFL students' skills. The enhancement of ELL education using MvT has been considered a valuable tool for improving students' communication (Apriani et al., 2024; Lee & Hwang, 2022), but other possible applications for EFL students are highlighted by the need to improve other ELL abilities such as reading, comprehension, and writing skills through lessons that employ the promotion of clear and effective communication (Apriani et al., 2024; Phillips et al., 2023).

Competent ELL skills are critical for an individual in expressing their ideas, thoughts, and arguments concisely. These skills allow the individual to communicate with people in different contexts, such as work and learning, which are important for the future of the individual (Ramamuthie & Aziz, 2022). A successful ELL further demonstrates an ability to think critically, organize information, and convey a perspective clearly to others. Competent ELL skills allow an individual to convey complex information with precision and clarity, and in a way that avoids misunderstandings (Phillips et al., 2023).

Purpose Statement

This study examined the ways in which MvT can enhance ELL. It was found that the tool makes it possible for EFL learners to use language in digital worlds created to mimic real-world scenarios such as discussions, teamwork, and solving problems, and beyond just reading or listening. Students in Saudi Arabia HEIs face many challenges, and research done previously indicates that the Saudi EFL learners often experience anxiety while speaking the English language (Moafa, 2020). This leads to demotivation and the use of unfamiliar instructional techniques, which further contribute to boredom in colleges (Quadir, 2021). This study examined

whether MvT was capable of improving the ELL process and adopted an integrative literature review approach to look at how instructors have used the tool to improve course administration for students in HEIs. The different approaches, best practices, and challenges faced help provide an understanding of what tools are ideal and how EFL classes could integrate MvT in HEIs in Saudi Arabia.

Research Question and Objectives

The following research question guided this integrative literature review and was used to address the problem of the study: What evidence-based guidance can be provided to EFL instructors in higher education about ways to use MvT that lead to increased learning?

The two primary objectives of this study were: (1) to review empirical studies that have used MvT in educational settings with EFL students to enhance ELL skills, and (2) to formulate evidence-based recommendations for instructors and higher education institutions that aim to use MvT in EFL education.

Significance

This study is significant because ELLs in Saudi higher education are still changing, and instructors need real examples of what works. Many programs have started to use MvT, but there is not enough current research showing how those tools actually help students learn. Pulling together what is already known would provide a clearer picture of how MvT can support ELL and what instructors can do to make that support work in real classrooms in HEIs.

The review offers a way for instructors and instructional designers to see what has already been tried, what helped, and what challenges remain. The goal is not just to describe available technology but to point toward teaching strategies that make it easier for students to

participate, communicate, and build confidence in ELL. The study adds to both the research base and the day-to-day practice of teaching ELL in HEIs in Saudi Arabia.

Organization of the Study

This study is divided into five chapters. Chapter 2 reviews the main research regarding MvT and EFL learning. Chapter 3 explains how the review was conducted, including how the studies were found, selected, and analyzed. Chapter 4 groups the results into three themes and connects them back to the research question. Finally, Chapter 5 connects the results to earlier studies, explains what they mean for instructors and schools, and suggests where more research is needed.

Chapter 2
Literature Review

Introduction

English language learning (ELL) is a significant barrier for many students and educators in Higher Education Institutions (HEIs) within the Kingdom of Saudi Arabia (Khawaji, 2022), resulting in a gap in Saudi HEI graduates' ability to obtain work globally due to their severely limited English language proficiency. These ELL skills present challenges for instructors in HEIs, as they are responsible for increasing student language proficiency; however, they lack this same ability to competently speak, comprehend, and write in the English language (Islam et al., 2022).

Competency spans a wide range of individual skills, including grammatical competence, linguistic competence, syntactic competence, textual competence, and genre competence (Zhou, 2023). However, these overlapping challenges reveal a systemic weakness in English proficiency that impacts both learners and instructors, necessitating immediate attention. Students need language skills both inside and outside of the classroom and acquiring these areas of knowledge could benefit students (Winans & David, 2022).

Using the Common European Framework of Reference for Languages, language talents can be categorized into six levels, each with its unique characteristics (Sudaryanto & Widodo, 2020). These levels, which range from elementary to advanced, primarily focus on the transition from elementary to more sophisticated structures. In this way, the CEFR framework provides a structured set of benchmarks, but the effectiveness of its use still depends on whether or not an environment is created that can move students through the related stages. Engaging learning environments are essential for students to transition from novice to expert status (Sudaryanto & Widodo, 2020).

Communication is crucial for professional interactions and career success. Report production, presentation planning, and letter sending are all examples of forms of communication that fall under this category (Alshammari, 2020). Albreiki et al. (2021) found that students' academic performance was stronger than scholastic performance. This specific gap highlights that while students may be successful in their assessments, they often still lack the applied skills for real-world communication that would provide job readiness.

In response, a need exists to support students with improved language skills, an effort that is recognized by agencies such as the National Association of Colleges and Employers (NACE). The NACE reported that 82% of employers place greater emphasis on the writing skills of a newly hired employee or job seeker (NACE, 2018). As a result, there is a clear need to further support these students through language education, which can support their future career endeavors.

Therefore, placing ELL challenges within the context of both academic and professional needs shows why the use of innovative educational solutions, such as technology-based learning, should be seriously considered. To fully understand how MvT can be used to support ELL, it is important to understand the historical development of educational technology and how it has been applied across different sectors.

Technological Innovations in Education

The study focuses on the development of new types of educational technology and how they may provide benefits for EFL students (Wang, 2020). The development of educational technology and its use in the classroom can be traced back to the invention of the chalkboard in the 1800s and through the introduction of film projectors and radio in the early 1900s (Sheerah, 2022). Then, in the 1960s, educational television, e.g., Public Broadcasting Services in the

United States, was first made available to the public (Sheerah, 2022). However, perhaps the greatest single change in how students learn came with the adoption of personal computers and the Internet during the 1980s and 1990s (Idrissi et al., 2024).

During the late 1990s through the early 2000s, educators saw the first interactive whiteboards and learning management systems, which had been designed to facilitate online and blended learning (Schwartz et al., 2023). Each of these developments provided new opportunities for students to acquire knowledge and laid the groundwork for further innovation (Wang, 2020).

Overall, these historical developments support current innovations in virtual reality, augmented reality, and artificial intelligence for educational use. More specifically, in the 2020s, when students were at home as a result of Covid-19, instructors were forced to adopt educational technology in new ways as educational delivery shifted from passive content transmission through traditional lecturing to more interactive and flexible approaches (Pozo et al., 2024). Both blended learning and online learning were affected by this phenomenon, which led to the adoption of additional technologies like Virtual reality (VR), augmented reality (AR), and artificial intelligence (AI). All of these options provide students with hands-on, individualized ways to learn, whether in the traditional classroom or at home (Paris et al., 2023; Al-Ansi et al., 2023; Sheerah, 2022).

Also, classroom technology is vital, as it aids students and benefits teaching. The new classroom technology allows the instructors to actively engage and communicate with students and structure the learning process based on their interests and motivation (Wang, 2020). According to a meta-analysis study, Sheerah (2022) found that technology-assisted Instruction (TAI) contributes positively to students' performance with an effect size of 0.35 between pre- and post-testing when comparing the experimental and control groups. TAI delivery also yielded

gradual enhancements in performance, supporting the long-term benefits associated with funding in technology and practices within education. The findings show the importance of technology adoption within institutions, as it helps produce measurable improvements in student learning outcomes.

Thus, the presence and availability of these technologies are known to provide convenience when it comes to applying diversification methods and developing individualized plans of teaching (Paris et al., 2023). The findings support the use of the MvT, which is a newer advancement in educational technologies that shifts learning from passive reception to interactive and context-rich experiences. Akram et al.'s (2022) study provided a survey that explored the views of instructors. Their responses showed that incorporating technology into learning has helped improve some aspects of education, and this was not restricted to any particular level of education. The study also highlighted the fact that the improvements were compatible with all contexts and settings.

Various theories are considered regarding the use of new technology, such as the Technology Acceptance Model (TAM), which focuses on the impacts of perceived ease of use (PEU) and perceived usefulness (PU) on the acceptance of technology in learning environments (Rajendran & Yunus, 2021). Understanding MvT's role in ELL requires examining educational technology's historical development across sectors. This historical context shows how innovations inform and extend current approaches to English language education. The transition from traditional educational tools to new immersive technologies lays the groundwork for examining the practical application of specific instructional strategies. Once we establish this foundation, we must scrutinize how specific technology-based interventions have addressed ELL skills, particularly in Saudi Arabia.

Technology offers numerous potential advantages for enhancing the quality of learning. It enables instructors to actively engage the student, building their interest and motivation (Wang, 2020). In a meta-analysis conducted by Sheerah (2022), the use of technology-assisted Instruction (TAI) was associated with a standard deviation increase of 0.35 in students' performance based on pre- and post-testing between experimental and control groups. TAI implementation produced documented performance improvements, contributing to the long-term benefits of investing in technological advancements within educational practices (Sheerah, 2022).

These findings explain why many educational institutions are willing to adopt new technologies. These technologies produce measurable improvements in student learning outcomes. The availability of such technologies may make it convenient to apply strategies promoting diversification and also help in developing an individualized teaching plan based on the needs of the students (Paris et al., 2023). This evidence positions MvT as the latest evolution in a continuous line of instructional technologies that shift learning from passive reception toward interactive, individualized, context-oriented experiences.

Furthermore, technology did not just change tools; it also changed expectations. Students began to look for learning that felt connected to real life. Over time, numerous technologies, including computers, the internet, whiteboards, and, more recently, virtual and augmented reality, have enhanced interaction in traditional classroom learning (Sawant, 2021). Akram et al.'s (2022) survey of instructors found that some believed that introducing technology into the learning process helps to improve some aspects of education, especially when it comes to teaching level. These findings highlight that the influence of technology is not limited to just one

sector or stage of education and the learning process, but rather it reaches across all contexts and settings.

Multiple theoretical frameworks exist to explain the role of technology in learning, such as the Technology Acceptance Model (TAM), which describes how perceived ease of use (PEU) and perceived usefulness (PU) shape users' attitudes towards adopting new tools (Rajendran & Yunus, 2021). These ideas enhance the understanding of the influence of instructors and learners on innovations, such as MvT.

To help understand MvT's potential in ELL, we need to trace how game-based educational technology has evolved over time and in different use cases. This helps to illustrate how each wave of technological development, from the traditional tools in classrooms to our present-day immersive environments, has influenced pedagogical approaches. This also explains why digital tools are now contributing to the transformation of language learning into a collaborative, student-led process. After establishing these broader grounds, the next step involves investigating how specific technology-based interventions have fostered the development of such ELL skills. This process occurs by virtue of providing examples, particularly from Saudi schools, where MvT presents fresh alternatives for improving English learning in line with the country's educational modernization aspirations.

Saudi Arabia's Approach to ELL through Educational Intervention

Saudi Arabia's Vision 2030 has contributed to a major transformation of education by focusing on students' communication skills and technological competence to make them competitive in the global market (Allmnakrah & Evers, 2020). With a promise to increasingly incorporate modern technology in schools, these reforms have profoundly transformed the

education system. However, there are challenges, especially in terms of instructor training and professional development needed to effectively use the technologies (Al Najdi, 2022).

There are a few instructors who feel adequately confident or competent to use more challenging digital tools such as MvT in their teaching. Despite these deficiencies, the national reform agenda has fostered a supportive culture for trying and testing technology-enhanced English as a Foreign Language (EFL) program, and such activities fall in line with Saudi Arabia's vision for its future.

The road to innovation and adoption of technology in education has not been smooth. There are still many challenges, particularly students' attitudinal and emotional resistance to learning English. It has been found that anxiety and low confidence are some of the main factors that hinder Saudi EFL students in the effective learning of English linguistics (Almelhi, 2021). For example, Alamri et al. (2021) investigated 327 Saudi female undergraduate students aged 19 to 26 years who were studying English as a foreign language. These students indicated that they experienced a lot of anxiety in their English learning activities. The issue is that classroom language teaching has typically placed more value on teaching grammar rules and sentence structure rather than adopting a more general and interactive type of approach. These approaches can instill confidence by helping to develop practical use of the target language. This finding suggests the importance of adopting more engaging and student-centered teaching approaches, such as those enabled by MvT, to produce low-anxiety and interactive learning contexts that foster active engagement and language use (Al Zahrani, 2019).

Altogether, the research has shown that without a change from a narrow grammatical focus toward a more holistic pedagogy for English instruction, Saudi EFL learners will continue to struggle to achieve the levels of competency or fluency that are aligned with international

standards and practical use. In addition to improving teaching strategies and classroom practices, teachers must devote attention to how accessible and inclusive these interventions are. This is particularly true for students with disabilities or those facing barriers to learning, which leads to the following discussion on accessibility and inclusion in education.

Increased Accessibility and Inclusion

Technology has fostered the student experience, which has changed significantly while also ensuring more inclusivity, as it allows students with disabilities or those living in remote locations to have access to education (Schwartz et al., 2023). In the United States, the Individuals with Disabilities Education Act (IDEA) required schools to provide special equipment and resources to ensure access to free, appropriate public education for children with disabilities (US Department of Education, 2024). IDEA created opportunities for learning that are equitable for all students, whether they are physically or cognitively disabled.

While U.S. law requires free, appropriate public education and disability support for students (U.S. Department of Education, 2024), Saudi Arabia follows its system of education inclusion through legal and regulatory frameworks. The Regulations of Special Education Programs and Institutes (RSEPI/RRSEP) started operating in Saudi Arabia in 2001, with special education policies from the United States as their foundation. The RSEPI provides students with disabilities access to free education, individualized education programs, evaluation methods, transition services, and related support services as needed (Alquraini, 2010; Education Profiles Saudi Arabia, 2021).

The Saudi Disability Law (2000) requires public agencies to provide educational, medical, psychological, and rehabilitation services to people with disabilities (Alquraini, 2010).

The Education Law 1389 (1970) of Saudi Arabia includes Article 188, which requires the state to provide educational services for students with physical or mental disabilities (UNESCO, 2018).

When viewed as a whole, these legal requirements and policies overlap and create a relatively comprehensive framework for providing an inclusive education for all students; however, the actual implementation remains uneven across the various regions and institutions in Saudi Arabia. The combination of U.S. and Saudi policies demonstrates that legal requirements need practical service delivery systems to succeed, which technology can effectively connect.

Ultimately, making learning technologically accessible has enhanced the planning and delivery of learning, which has benefited not only students with disabilities but also all groups within the given learning environment (He & Li, 2023). For instance, educators who used digital platforms to accommodate students required special arrangements or were geographically far away (Ok et al., 2020).

Ok et al. (2020) stated that digital tools and resources can effectively support students struggling with traditional lesson resources. Online technologies, such as adaptive learning platforms and assistive devices, provide alternative pathways with educational content, which is one way to meet this requirement (Klimova & Zamborova, 2020). Thus, the legal expectation for equitable care would directly intersect with the use of technology-based solutions that would ensure more feasibility and inclusivity. This makes it possible to reach students who, in the past, would not have had access to education.

The primary benefit of using digital platforms in education is the effectiveness of feedback and evaluation (Hazaymeh, 2021). Tools make knowledge management possible on these digital platforms, which allow educators to track students' performance in real-time and

supply instant feedback (Shadiev & Yang, 2020). Digital tools strongly support the notion of formative assessment, where continuous assessment informs instruction (Hazaymeh, 2021).

Chen et al. (2021) noted that technology helps educators to track student progress and also adjust the teaching strategies based on student outcomes and individualized needs. In online learning environments, technology supports timely feedback that can guide progress toward achievements (Shadiev & Yang, 2020). This finding suggests that accessibility is not just about initial entry into the educational setting but also about the ability to consistently participate.

Thus, integrating technology into teaching and learning goes beyond mere access (Chen et al., 2021). Technology in teaching EFL has been beneficial not only to the instructors but also to the learners (Hazaymeh, 2021). Huang et al. (2021) examined the application of virtual reality (VR) in language acquisition, discovering that immersion fostered a natural learning environment, significantly increasing engagement among university students and improving their comprehension in speaking and listening. Huang et al. (2021) demonstrated that integrating VR into language learning enhanced university students' understanding and motivated them to practice more.

The realistic environment that is implemented in VR cannot be created with traditional methods, making it an emerging tool for the future of language education (Chen et al., 2021). When reviewed in terms of broader accessibility regulations, these immersive tools show how inclusion could extend beyond mandates. For example, the use of immersive tools like MvT can extend beyond just accommodating students and their individual needs, creating universally engaging learning opportunities and environments for a wide variety of learners.

Institutions such as the National eLearning Center (NeLC) offer high-quality virtual classrooms and online courses that cater to the needs and abilities of adaptive learners (Sun &

Wang, 2020). The continuous expansion of NeLC leads to the opening of new educational territories, driven by the increased demand for accessible and inclusive learning environments. According to Sun and Wang (2020), the adoption of digital learning materials, such as those offered by NeLC, significantly improved the rankings when it occurred for learning EFL among college students. This shows how the development of national initiatives, such as the NeLC, can work to provide a large-scale response to both the demands of accessibility laws as well as the need for pedagogical guidance. This underscores the notion that inclusion and innovation frequently serve as mutually reinforcing goals.

MvT in the Industry Sector

The 1992 science fiction novel "Snow Crash" by Neal Stephenson popularizes the metaverse concept (Laeeq, 2022). However, advancements in technology have made it possible to implement the concept in the real world. By the mid-2000s, interactive virtual environments were accessible to the public (Buchholz et al., 2022). These environments offered various potential entry points to connect with other individuals (Anderson & Rainie, 2022). Additionally, the benefits of MvT increased due to the availability of high-speed internet and, in succeeding years, the introduction of virtual reality headgear and the continued development of augmented reality applications (Anderson & Rainie, 2022; Laeeq, 2022). These developments collectively established the necessary infrastructure for extensive experimentation with MvT applications across various sectors.

MvT encompasses all virtual worlds, augmented reality, and the Internet in their totality (Wang & Lai, 2023). Many components make up MvT, and some of the major requirements include high internet speeds, VR, AR, and blockchain technology (Piras et al., 2024). According to the findings of Piras et al. (2024), these components are critical in ensuring interaction and

helping to bridge the gap that exists between physical and digital systems. The metaverse is a technologically advanced, physically persistent virtual environment (Lee, 2023). Its scope extends beyond entertainment to education, healthcare, and industry applications.

In industry, MvT provides immersive virtual environments by developing replicas of real-time classrooms or context situations that improve production, analyze performance, and test changes before real-world implementation (Alpala et al., 2022). Organizations use MvT to simulate processes, design products, train employees, optimize operations, identify issues, and make data-driven decisions within virtual spaces, improving efficiency, reducing costs, and accelerating product development (Devagiri et al., 2022). This unique architecture proves particularly valuable in manufacturing and engineering (de Assis Dornelles et al., 2022; Khorasani et al., 2022).

The MvT and other similar technologies are known to have multiple applications, as they are capable of generating immersive virtual environments where users would be able to interact with digital objects as in real life. For example, in the case of manufacturing research, a study has demonstrated the ability to use the technology to optimize and enhance the workflow in a plant while also training the individuals within these virtual environments. This enables workers to gain experience without the risk of working on machines (Alpala et al., 2022; Yao et al., 2024). Such benefits can be seen in different sectors where simulation-based learning is adopted, using technology like MvT to help improve operational safety, design optimization, innovation, and learning.

Based on convincing evidence, utilizing MvT in learning would not only be productive, but it would also seem to drive business practices and life limitations. The successes showcase the broader potential of MvT technology to elevate the impact of educational and language-

learning experiences with immersive technology to deliver more engaging, effective, future-ready learning (Lee, 2022; Tortorella et al., 2021).

In the healthcare industry, MvT is primarily used for immersive medical training simulations, which allow the students to gain hands-on experience with treatments without endangering the patient (Lee, 2022). Research has demonstrated that patient education through virtual environments, remote consultations, and advanced visualization of medical data can improve healthcare outcomes, particularly for homebound patients (Bansal et al., 2022; Mitchell & McCarren, 2023). Furthermore, MvT enables healthcare professionals to perform complex procedures, treat mental health conditions with virtual therapies, and better understand patient anatomy in a 3D space, all through technologies such as VR and AR.

Typically, using the formation of a wholly computerized setting is referred to as VR, which is also the term for the comprehensive process (Dede & Barab, 2009). By donning a VR headset, the user engages with an environment that human factors, to some extent, control (Chen et al., 2021). The MvT has received massive investments, with Facebook joining the project relatively recently (Lee, 2023). He and Li (2023) recently undertook a systematic review regarding Metaverse-assisted language learning. He and Li (2023) concluded that several research areas for VR in second language acquisition have yet to be investigated, including studies in language for specific purposes.

As technology advances, evidence indicates that VR is increasingly playing an important role in education, offering innovative and effective teaching methods (Dede & Barab, 2009). These varied, industry-level applications in various contexts highlight how MvT can serve as a flexible and transformative type of technology. Accessibility laws and related national initiatives show how technology can be used to create a more equitable environment, and industry

applications demonstrate MvT's practical value across sectors. The next step is to consider how these specific technology-based tools can be applied in educational settings to support English as a Foreign Language (EFL) learning.

MvT in Education

EFL students are worried about the updated strategies to improve their performance (Al-Shorman & Al-Shehri, 2021). Other studies, like Lee and Hwang (2022), have investigated the use of technology in learning settings by focusing on the K-12 pedagogical values of VR and MvT. Furthermore, Alobaid (2020) highlighted that using technology can be useful for K-12 students, specifically tools like sophisticated multimedia and integration with YouTube.

Research such as this suggests that there are exciting technological applications for language learning, but the evidence is still developing. More work is necessary for instructors to have a reliable sense of how well this translates into actual classrooms. Alobaid (2020) asserts that the impact of technology on language learning is uncharted territory, and there is insufficient empirical evidence to support possible long-term effects. Al-Shorman and Al-Shehri (2021) and Sun and Wang (2020) have pointed out that future research should consider investigating the effectiveness of the targeted educational interventions that address reported performance issues.

MvT has also demonstrated strong potential to increase student participation, engagement, and motivation in domains beyond language learning (Hakan Kayakökü, 2023; Johnson et al., 2016; Wu et al., 2024). One of the best examples is from STEM education, where studies have indicated that the tool is critical in increasing motivation to learn. This is because it provides the opportunity to conduct inquiries in real-world context-based environments (Johnson et al., 2016).

This trend among diverse subjects suggests that with the use of immersive technology, learners are more likely to remain engaged by learning through real-world contexts and concrete experience. Reviews have also stressed the utility of technology as a device for training students in EFL (Wu et al., 2024). Wang and Lai (2023) point out that MvT is congruent with educational theory by facilitating the acquisition of natural language through interaction and immersion.

These results indicate that technologies like MvT are moving from experimental innovations to legitimate teaching models and that by incorporating interactivity and hands-on experience into teaching, they are able to make language learning more dynamic and productive. This enables students to comprehend and apply English in ways that reflect actual communication situations (Wang & Lai, 2023; Wu et al., 2024).

The efficacy of incorporating MvT in the classroom is based on several factors, including engagement and motivation (Yamaç et al., 2020). Some students may also feel motivated by participating in language learning relevant to their everyday lives (Mbati & Minnaar, 2015). According to Mbati and Minnaar (2015), another benefit of relating language learning to students' everyday lives is that children may be encouraged to learn by working together on projects.

Everyday relevance, peer collaboration, and motivational design come together to show why MvT's social and interactive features are considered especially promising for potential use in language contexts. In this context, the ability to consider the features of the metaverse (i.e., shared, persistent, and decentralized) can facilitate exploration of this connection (Mbati & Minnaar, 2015; Wang & Lai, 2023).

Social constructivism emphasizes that learning occurs through interaction and collaboration among people. Therefore, MvT can offer meaningful learning experiences by

bringing students together to interact in common virtual spaces (Mbati & Minnaar, 2015). It is the collaborative process of knowledge construction that stands out, rather than simply the mere sourcing and reception of information. Although MvT is promising for increasing student engagement and retention, further studies are needed to prove whether it fosters sustained learning performance.

In examining the technological components of mediated virtual tours, which include VR, AR, and other immersive tools, we can identify that each has different impacts on language learning. VR may provide authentic communication situations, AR can mix virtual cues with the real-world physical setting (doing mixed reality tasks), and immersive platforms can offer interactive contexts to practice speaking, listening, and collaborating. In combination, these technologies could turn traditional English learning into a riveting social experience.

Virtual Reality (VR)

VR can generate an immersive and interactive visual experience, which is well-suited for use in education (Chen et al., 2021). It enables educators to create simulated learning experiences of actual or historical scenarios that are adapted to course requirements and student preferences (Al-Ansi et al., 2023). In the field of language learning, VR offers virtual environments such as virtual classrooms, cities, or laboratories. These environments are where individuals are able to practice English in spaces similar to authentic places (Pataquiva & Klimova, 2022). This framework improves their communication and comprehension skills, and these virtual experiences enhance the connection between theory and application when instructors guide learners. Kumar et al. (2021) also argued that VR learning environments improve the quality of both teaching and language use, providing instructors and students with a more active, practical way of achieving proficiency in English language skills.

Ultimately, with the development of technology, VR is now considered to be a powerful tool for learning as well as teaching, and it provides an opportunity to learn in innovative ways (Pataquiva & Klimova, 2022). The fact that it is immersive in nature makes VR-based learning particularly effective in various contexts (Parmaxi, 2023). For the EFL students, VR promotes engagement and strengthens cognition by giving learners interactive spaces to practice grammatical structure, vocabulary use, sentence formation, and writing composition (Wang & Lai, 2023).

Unlike traditional teaching, VR will allow students to practice these techniques in real-life settings that are fun and engaging. The technology also provides virtual immersion in English-speaking environments so that students experience cultural input, which helps increase language fluency (Al-Ansi et al., 2023). Students can also visit virtual tourist attractions, participate in cultural activities, engage native speakers through avatars, and acquire a deeper understanding of English-speaking communities (Chen et al., 2021). With this combination of factors, VR makes language learning immersive and culturally stimulating in a way that enhances confidence as well as competency in using English.

Augmented Reality (AR)

AR is a useful technique for improving learning through additive virtual information over real-world scenarios (Al-Ansi et al., 2023). It also provides students with an opportunity to navigate 3D models of objects or buildings so that they are no longer learning through the textbook format but engaging with something more real. According to Fan et al. (2020), on-body translation (as an AR tool in public situations) may support learners in better comprehending words' meaning and context, enabling them to understand and respond appropriately to the presented words. With motion and context added to lessons, AR enhances the immersive

experience of VR, and the two together act as a complementary force. However, literature underscores AR's growing significance in educational contexts and its potential for enhancing learning uptake and support across subject areas (Al-Ansi et al., 2019; Fan et al., 2020; Feng & Ng, 2016).

Immersive Learning Environments

Constructing a virtual learning environment is critical (Alfadil, 2020). Both virtual and augmented reality are integrated into this overall technology, with the aim of improving the overall learning process (Parmaxi, 2023). Virtual learning environments are becoming increasingly popular in today's educational landscape (Berns, 2021). The term virtual learning environment" describes a setting where students can practice and demonstrate their responses to situations similar to those they encounter in college (Alfadil, 2020). This process reflects the broader trend in the field of educational innovation in which simulations are used alongside authentic tasks to strengthen the bridge between theory and practice, ensuring that students are ready to use the skills they acquired in real-world settings.

Using real-life happenings as the basis for these scenarios is how the aforementioned objective is attained (Sawant, 2021). An example is a student who, while participating in an online workshop, simultaneously uses a collaborative tool to write papers and share them with other students and instructors (Sawant, 2021). In addition, VR, AR, and immersive environments all demonstrate how MvT can support meaningful learning experiences. These benefits become clearer with the examination of the broader advantages that MvT offers in education. When viewing the use of these technologies as a whole, these findings imply that MvT's value emerges when immersive authenticity is coupled with tasks for language learning and is not as effective on its own.

Advantages of MvT in Education

The adoption of the tool would help increase student engagement, and the assignments could cover multiple tasks that introduce a broader range of obstacles that need to be overcome. Additionally, it would offer collaborative opportunities that traditional learning environments do not offer (Jiao et al., 2024; Cantone et al., 2023). It also allows students to work at their own individual pace and learn based on their preferences (Thrasher, 2023). This balance between collaboration and autonomy suggests that MvT can be used to support differentiated learning approaches, accommodating diverse learner needs and preferences.

Students gain knowledge from their instructors and classmates, which is an essential part of social learning theory (Jiao et al., 2024). The learning process could be further improved for students via increased engagement and tasks that mimic real-life situations, as this would encourage problem-solving and creativity (Cantone et al., 2023). Mourtzis and Mystakidis (2022) mention that for learning to be truly effective, there is a need for it to happen within a realistic and practical context. The experimental learning approach, when combined with MvT, allows for the creation of this environment.

Consequently, the integration with MvT is known to be key for developing critical thinking and innovation. One study observed that online classes designed using real-world contexts allowed learners to reflect on language use and receive constructive feedback while continuously enhancing their language skills (Thrasher, 2023; Lee, 2023). Thus, it is not just a tool that can be useful for practice but a platform that links theory with collaboration and applied learning. Students can also enroll in these classes based on their preferences.

MvT may enhance students' skills through increased engagement and motivation within their education journey. Immersive learning may enable learners to engage with a wide range of

subjects, from mathematics to the sciences, in relevant virtual contexts (Kayakökü, 2023). Initial investigations into virtual learning environments for education have shown promising results (Parums, 2021). The real-time feedback provided through MvT directly relates to formative assessment and practice, which shows how MvT could be used to improve both engagement and instructor responsiveness in the classroom. Feedback on actions is both active and in real time and is made possible by the fact that MvT is an online platform (Jiang & Fryer, 2023). Consequently, incorporating this input into the platform is an essential requirement (Parums, 2021).

Typically, a stimulating and interactive instructional experience can engage students' attention and enhance their desire to take part in academic work, leading to learning enhancement (Talan & Kalinkara, 2022). Another example is that the inclusion of VR had a significant impact on student engagement in K-12 education with science lessons over traditional teaching methods (Jiang & Fryer, 2023). Overall, these results indicate that MvT shows promising potential for the improvement of student motivation and engagement in all subject matters. This tool can keep students more focused and involved in classroom activities and engaged in active learning (Jiang & Fryer, 2023). Despite these benefits, there are several challenges in the real world resulting from the high costs of acquiring technology and limitations on its availability and usage, as well as a need for better instructional methods. This requires mindful consideration before implementing MvT in an effective and equitable manner within educational institutions.

Challenges and Limitations of MvT in Education

Integrating MvT into EFL requires the consideration of financial and access barriers (Parmaxi, 2023). One of the main challenges that exists is cost inequality, which makes it harder

for some to gain access to tools compared to others (Parmaxi, 2023). The high costs of equipment, maintenance charges, and limited availability of VR devices may impede their general acceptance and fair involvement in English Language education (Lee, 2018).

Another major limitation with MvT is the technical proficiency required on the part of both instructors and learners. This is important, as technical difficulties may diminish the learning experience (Feng & Ng, 2023). Thus, while there are financial limitations to accessing and using MvT, other challenges, like technical limitations, also determine the quality of access and use. This reality creates a layered set of challenges for implementing the related recommendations in school settings.

The potential limitations of MvT, including costs and resources, must be considered. Communication for EFL learners is critical as it facilitates finding common understanding and fosters knowledge creation as a group (Shadiev & Yang, 2020). The effective use of MvT assumes a prior level of competence in maneuvering and using similar technologies (Pinto et al., 2021). This suggests that digital literacy, and not just language-based literacy limitations, is a precondition for the successful use of MvT in classrooms. For some students and instructors, the navigation of the tool and system could be challenging based on experience level and technology knowledge (Pinto et al., 2021).

MvT's effectiveness is based on providing instructors with training programs to gain knowledge and skills (Tanrısevdi, 2021). Integrating new technologies without providing users with the required training could hinder adoption and use, as most people feel reluctant and scared to use them when they are not trained (Lan, 2020).

MvT experiences frequently involve solitary engagement, which may exclude students from the opportunity to engage in collaborative language learning (Ondarra et al., 2020). It could

be argued that even though MvT is capable of replicating authentic environments, its design may ultimately conflict with the collaborative goals of language instruction. Engaging in VR language learning exercises may improve the growth of collaboration skills among students, but further research is needed to support the known value of these interventions (Shadiev & Yang, 2020).

In some cases, MvT is capable of replicating situations for ELL practices (Lan, 2020). Asad et al. (2021) argued that the synthetic nature of VR simulations may not adequately equip students for real-world language and communication challenges, which limits the practical utility of their abilities. According to Lan (2020), excessive prioritization of technology may be detrimental to effective instructional methods in language learning. When technology is treated as the end rather than the means, it risks the use of technology itself overshadowing the proven pedagogical practices and potential applications that are aligned with the primary learning goals. According to Wu et al. (2024), putting more focus on just MvT could have a detrimental effect, as it would shift focus from essential elements of effective language learning; this includes clear and direct feedback, providing support and guidance, understanding different genres in education, and employing persuasive methods.

These challenges show the need for a balanced approach, with conclusions suggesting that tools like MvT be used as a way to enhance instead of replace, while integrating people-centered aspects. We need research to determine the tool's usability and comprehend its limitations before its adoption (Asad et al., 2021). This study fills this gap. To better evaluate the benefits and limitations of this use, it is necessary to ground the findings within established pedagogical theories and base them on a framework that can help interpret MvT’s role in

language education. Thus, adoption decisions should weigh not only the device's availability but also the support within the ecosystem that would determine the quality of use.

To conclude, of the main research gaps identified, three points were significant. Firstly, there is limited research in Saudi Arabia that focuses on how the use of MvT may lead to the enhancement of students' English skills (quality of writing, vocabulary, and general language proficiency), outside of short-term involvement. Secondly, most studies do not compare MvT with other modern, interactive teaching methods and only contrast it with traditional teaching. Finally, limited evidence exists on the quality of implementation, cost, and whether all students or instructors could equally access or benefit from MvT programs. These limitations emphasize how this current study is targeting real learning outcomes, ease of use in the classroom, and a connection to established teaching theories.

Theoretical Perspectives on English Language Learning Challenges

The augmentation of MvT in English language learning is contextualized in this study through multiple theoretical perspectives relevant to learning and technology implementation. Some of the key concepts considered from theoretical perspectives include mediation, internalization, and Vygotsky's (1987) Zone of Proximal Development (ZPD). This view is highly consistent with Creswell's (2014) learning theory that highlights the importance of culturally mediated tools, both psychological and technical, to contain and promote cognitive development and learning processes, and these instruments serve as mediators between outside knowledge and inside knowing.

Constructively, Hof (2020) clarifies that with tools like these, students can internalize information and create their own understanding. In this regard, VR and AR can be used as

external instruments in the learning process to realize the effects of social interaction and create environments for immersive, interactive language learning (Huang et al., 2021).

Ultimately, these studies imply the need to treat technology not as an isolated teaching machine, but rather as a cultural and cognitive prosthesis that stretches learner capacities. In the ZPD framework developed by Vygotsky, students can accomplish more than they could alone, given guidance and collaboration (Hof, 2020). Therefore, technologies such as VR and AR support both the social and cognitive aspects of learning, allowing for greater comprehension through shared experiences with scaffolding.

Many theories have been developed to explain the challenges EFL students face in acquiring language skills (Muamaroh et al., 2020). A study by Poehner and Lantolf (2024) compared these ideas with Vygotsky's (1987) sociocultural theory, which emphasizes that learning is shaped by social interaction and community involvement. This perspective highlights that language learning is not only an individual cognitive process but also a socially mediated experience, making it especially relevant in immersive, collaborative environments like those supported by MvT.

In many EFL contexts, students have limited chances to engage in honest communication, which hinders their ability to develop conversational competence (Muamaroh et al., 2020). Similarly, Krashen's (2019) Input Hypothesis proposes that learners acquire language when they are exposed to comprehensible input, or language that is slightly beyond their current level of understanding (Chen et al., 2024). This idea aligns with Vygotsky's concept of the ZPD, as both stress the importance of providing structured input, guidance, and support to help learners make meaningful progress in mastering a new language.

Krashen's work aimed to provide support for categories of input. Al Hilali and McKinley (2021) concluded that the language level of EFL needed to be improved to convey information in an easily understandable manner. Resolving this problem could improve the students' reading and writing abilities (Al Hilali & McKinley, 2021).

When synthesized, these theories emphasize that both the quality of input and the provision of support are important. Further, the use of socially interactive contexts is important, which shows that MvT could be positioned as a tool that addresses multiple needs. These theoretical commitments guide the present study's task design, including the selection of scaffolding activities within learners' ZPD, input calibrated near i+1, and its focus on language proficiency rather than the level of student engagement alone.

Summary

The reason for delivering education to students with more relevant tools is to prepare them to better face real-life situations (Talan & Kalinkara, 2022). Students can access resources through virtual worlds, and online environments can enable them to interact with virtual characters, explore areas, and modify elements (Wang et al., 2022). These opportunities demonstrate that MvT not only offers novel technology for students to use but also provides a platform that bridges classroom learning with practical applications. Thus, students can gain practical experience through participation (Wang et al., 2022). In addition, VR environments can be programmed to provide immediate feedback on grammar, vocabulary usage, coherence, and other aspects of language learning (Feng & Ng, 2023). As a result, immersive programs may be beneficial for student feedback (Feng & Ng, 2023).

A key objective of MvT is to cultivate work-related and participatory learning environments. As such, MvT may positively impact on the amount of motivation and

enlightenment that students experience (Mourtzis & Mystakidis, 2022). According to Wang and Lai (2023), students in higher secondary schools who learned through virtual reality had a significantly higher level of involvement in their studies than students who learned through other conventional methods of instruction. Integrating MvT makes the subject more fascinating, attracting the learners' attention and improving the learning process (Thrasher, 2023). Chapter Three presents the study's design and methodology.

Chapter 3
Research Methodology

The purpose of this integrative literature review was to examine the existing literature related to using MvT to enhance students' English Language Learning (ELL) skills. The study identified how the integration of MvT could address challenges in engaging students at Higher Education Institutions (HEIs) and improving their English language proficiency skills, as well as addressing challenges in English as a Foreign Language (EFL) teaching and learning. The guiding research question is: What evidence-based guidance can be provided to EFL instructors in higher education on ways to utilize MvT that lead to increased learning? The two objectives of the study were to analyze prior work researching the use of MvT in educational settings (focusing on those that have been used with EFL students to enhance English language skills) and to formulate suggestions for instructors in higher education who wish to use MvT with EFL students.

Introduction to Study Design

For this research, an integrative literature review (ILR) approach was chosen, which allowed for the development of a comprehensive and detailed picture of the subject by combining and synthesizing evidence from different research. Torraco (2005) mentions that this method is capable of synthesizing and analyzing earlier studies to create new theoretical frameworks or generate new insights, and that this methodology enables a holistic examination of empirical and theoretical work, resulting in better apprehension of multifaceted issues (Sarkis-Onofre et al., 2021).

This ILR model was especially appropriate for the present study since research on MvT in EFL education has been conducted based on various research traditions, such as experimental

studies, classroom reports, and conceptual analyses. By bringing together various evidence, the ILR allowed for the identification of common patterns, themes, and significant gaps in the literature. This approach was consistent with the generation of practical and theoretical knowledge about how MvT could facilitate language learning. In the end, working with an ILR was beneficial to generate evidence-based recommendations for instructors at Higher Education Institutions (HEIs). These recommendations may assist them in integrating MvT into English instruction effectively and mindfully.

Integrative Literature Review Process

The study conducted an integrative literature review using the six-step process established by Whittemore and Knafl (2005), as illustrated in Figure 1. An integrative review uses these six steps to help the researcher formulate a response to a posed research question.

Figure 1

Six Steps of the Integrative Review Process

Note. From Whittemore and Knafl (2005).

Step 1: Formulate Purpose and Research Question

The formulation of the purpose statement and research objectives was based on the identified problem to be addressed. The two research objectives were: (1) What teaching

practices do experts believe are necessary for higher education instructors to use MvT with EFL students, and (2) What are experts' perceptions of the current scholarship of MvT in EFL classrooms? The overriding goal was to explore the use of MvT in teaching practices to determine potential outcomes for the application of this technology by instructors at Saudi Arabia's higher education institutions. Using an integrative review, the study generated new knowledge about the use of MvT to enhance ELL among EFL students in HEIs.

Step 2: Systematically Search and Select Literature

The process for selecting articles associated with the phenomenon being investigated involved selecting relevant databases that were aligned with the topic of study to provide the scholarly works most suitable for synthesis and review. The databases included Web of Science, ERIC, PsycINFO, Scopus, Engineering Village, and Education Research Complete. The databases were searched using the above inclusion criteria. After the selection of critical databases, the second step included accessing and searching each of the databases for the following keywords and phrases within the article title, abstract, and keywords:

Box 1: "metaverse technology" OR Mvt OR "augmented reality" OR "ar" OR "mixed reality" OR "mx."

Box 2: "English as a foreign language" OR "EFL" OR "English as a second language" OR "ELL" OR "English language learners" OR "English Language Learners" OR "ELL" OR "L2."

Box 3: "adult OR college" OR "university" OR "postsecondary education" OR "undergraduate" OR "teaching higher education."

The resulting literature was assessed based on the inclusion criteria necessary to narrow the scope and establish a synthesis. After the databases were searched, each scholarly work was

evaluated based on specific inclusion criteria, first reviewed by title, then by abstract and keywords, and then by an assessment of the full work.

To ensure academic rigor and transparency in the research process, inclusion and exclusion criteria were clearly defined in advance and applied when selecting which studies to use. Table 1 presents the criteria that established the boundaries for eligibility and that were used to ensure that the review remained fully aligned with the main research question.

Table 1

Inclusion and Exclusion Criteria

Criteria Type	Inclusion Parameters	Exclusion Parameters
Publication Date	Studies published between 2015 and 2024	Studies published before 2015
Language	English-language publications	Non-English publications
Access	Full-text articles available through academic databases	Abstracts or unavailable full texts
Study Type	Peer-reviewed empirical, theoretical, or case-based research	Opinion papers, editorials, or conference summaries lacking data
Educational Context	Higher education or adult EFL learning environments	K-12 or general educational technology without an EFL focus
Technology Focus	Studies addressing Metaverse Technology (MvT), Virtual Reality (VR), or Augmented Reality (AR)	Studies without a clear application of MvT/VR/AR tools
Relevance to Research Question	Focus on EFL skill development (reading, writing, speaking, listening, and comprehension) using immersive technology.	Studies unrelated to EFL skill acquisition or instructor guidelines

The application of these clear parameters ensured that each study included in the final corpus would directly contribute to the final understanding of how MvT could enhance EFL instruction in HEI settings.

Following the initial database search and the application of the inclusion and exclusion criteria outlined in Table 1, the process of identifying, screening, and selecting appropriate studies followed the Preferred Reporting Items for Systematic Reviews and Meta-analysis (PRISMA) 2020 Guidelines (Page et al., 2021). The PRISMA framework provides a standardized and transparent structure for documenting the number of records that were identified, screened, and systematically excluded or included at the end of each stage of the process.

Figure 2, which is presented in Chapter 4, illustrates the PRISMA flow diagram used in this study. The diagram visually summarizes the literature selection process, including records that were identified through database searches, removal of duplicates, full-text assessments for eligibility, and the final number of studies included in the actual synthesis. Using PRISMA ensured a clear audit trail for how sources were selected, enhancing the overall reproducibility of the review.

Step 3: Quality Appraisal

Once the inclusion and exclusion criteria were met, studies were subjected to a structured quality assessment (QA). This method was implemented to evaluate the quality and appropriateness of each study in terms of relevance to the purpose. The QA process ensured that only high-quality studies were included in reviews. It also confirmed that the studies met the eligibility criteria and underwent checks for research design, data collection procedures, validity, and transparency. This step had to be taken to establish both the appropriateness and reliability of the included evidence in guaranteeing that the final analysis was grounded in valid and dependable research evidence (Page et al., 2021). The Mixed Method Appraisal Tool (MMAT, 2018) was selected for this process because it could be applied consistently across studies that

use qualitative, quantitative, and mixed methods-based research. Each study was scored according to the criteria outlined in Table 2, which summarizes the characteristics used to rate the study's quality.

Table 2

QA Procedures

Criterion	Evaluation Focus	Quality Indicator	Appraisal Decision
Clarity of Purpose	Is the research question or objective clearly stated and logically connected to the design?	The aim was clearly stated and aligned with the design.	Include
Methodological Rigor	Are data collection and analysis methods appropriate and transparent?	Replicable, well-documented methods	Include
Data Adequacy	Are data sources sufficient and credible for drawing conclusions?	Comprehensive, relevant data sets	Include if adequate.
Analytical Transparency	Are analytic procedures described clearly and supported by evidence?	Valid interpretation of results	Include
Relevance to Research Question	Does the study address MvT, VR, or AR in EFL higher-education contexts?	Direct relevance	Include
Overall MMAT Score	Composite evaluation of methodological soundness	≥ 50% threshold for inclusion	Exclude if below threshold.

Studies that met at least 70% of the MMAT criteria were categorized as "high quality." Those meeting 50–69% were categorized as "moderate quality," and those below 50% were dismissed as too low quality for inclusion in the synthesis. This process improved the ILR's transparency, credibility, and integrity. This process also ensured that the findings were drawn from a robust and methodologically sound process.

Step 4: Analysis and Synthesis

After identifying all selected and screened texts, the process of data analysis began by evaluating each study and presenting a synthesis of the themes. The final selected articles were evaluated based on their association with the research question and purpose statement. The relevance of each study to the research objectives was assessed. Furthermore, the development of the methods, design, population, sample, data collection, analysis, and results were stored in a Word table (Appendix A).

For this step, a thematic analysis was used to organize and interpret the data that was taken from the reviewed studies. The thematic analysis followed the process outlined by Braun and Clarke (2006). The steps for this process are as follows: familiarization with the data, coding, and grouping codes into themes. Correspondingly, each article was read and reviewed so that the researcher could gain familiarity with the findings and identify the repeated ideas. Patterns and use of keywords related to EFL were noted, and the use of MvT was also specifically noted. These recurrent patterns were then coded manually, and the codes were grouped into broader categories reflecting shared meaning across multiple studies. Using this approach allowed for both conceptual and empirical data to be compared side-by-side and ensured that the synthesis represented the full range of available research. The development of themes was an iterative process that was refined through continuous review to ensure that each study included was connected directly back to the primary research question.

Data analysis identified the key theme(s) present throughout the articles as related to the student-level, teaching-level, and technology-level factors in relation to MvT, and improving ELL proficiency amongst EFL learners in formal HEIs educational settings. The final themes

were presented categorically as related to the research question. The findings associated with each theme were described through synthesis and are discussed in Chapter 4 (Page et al., 2021).

Step 5: Discussion and Conclusion, and Step 6: Dissemination of Findings

The discussion and conclusions drawn from the analysis, which involved a review of the themes identified in the literature during Step 4, are presented in Chapters 4 and 5. A discussion of the disseminated findings concludes this study. Chapter 4 presents the findings, sharing the information drawn from the literature review. The results from the analysis were presented in tabular form, accompanied by an explanation of the thematic patterns that emerged.

Ethical Considerations

Because this study uses previously published research and does not involve contact with new participants, formal institutional review board (IRB) approval was not required. However, this does not mean that ethics was not considered. Ethical research standards were maintained by ensuring that findings from all studies were cited and reported correctly. This was done by accurately reporting the findings from previous studies, diligently coding the data, and accurately citing work. Transparency was also used in the process of designing the methodology and corresponding inclusion and exclusion criteria to ensure that the process was consistent, reproducible, and ethically executed. Finally, every effort was made to interpret the reviewed studies objectively and avoid biases in analysis or presentation.

Summary

This chapter described the methodology used to conduct an integrative literature review, including study identification, screening, quality appraisal, and thematic analysis. Applying the PRISMA 2020 framework ensured transparency in study selection, while the MMAT provided a

structured approach to assessing methodological quality. Thematic analysis organized the data into meaningful patterns that directly addressed the research question. Chapter 4 presents the results of this analysis, organized around the three major themes identified across the reviewed literature.

Chapter 4

Findings

In this chapter, the findings from the integrative literature review are provided. It focused on the procedures developed for data collection and analysis, reviewed the integrative review approach, and discussed the exclusion, inclusion, and final selection of articles considered eligible for this study. Chapter 4 presents each theme, the guiding and research objectives, and the purpose of the study. A summary concludes Chapter 4, reemphasizing the key findings and their relationship to the research study.

Data Collection and Analysis

In this section, the data collection and analysis procedures for the integrative literature review are discussed. For the process of identifying key themes, research was initially evaluated using the PRISMA flow diagram, which involves identifying records from databases, screening records, obtaining records for review, and including the final set of eligible studies in a synthesized review (Whittemore & Knafl, 2005). Finally, the integrative report also considers the number of records removed before screening, the number of exclusions, and the total number of articles included. In the case of this study, Table 3 provides an overview of the key PRISMA flow diagram data relevant to the search, retrieval, and exclusion processes. Table 3 presents the number of records found, excluded, and used in this study. Figure 2 illustrates the steps in the following data table.

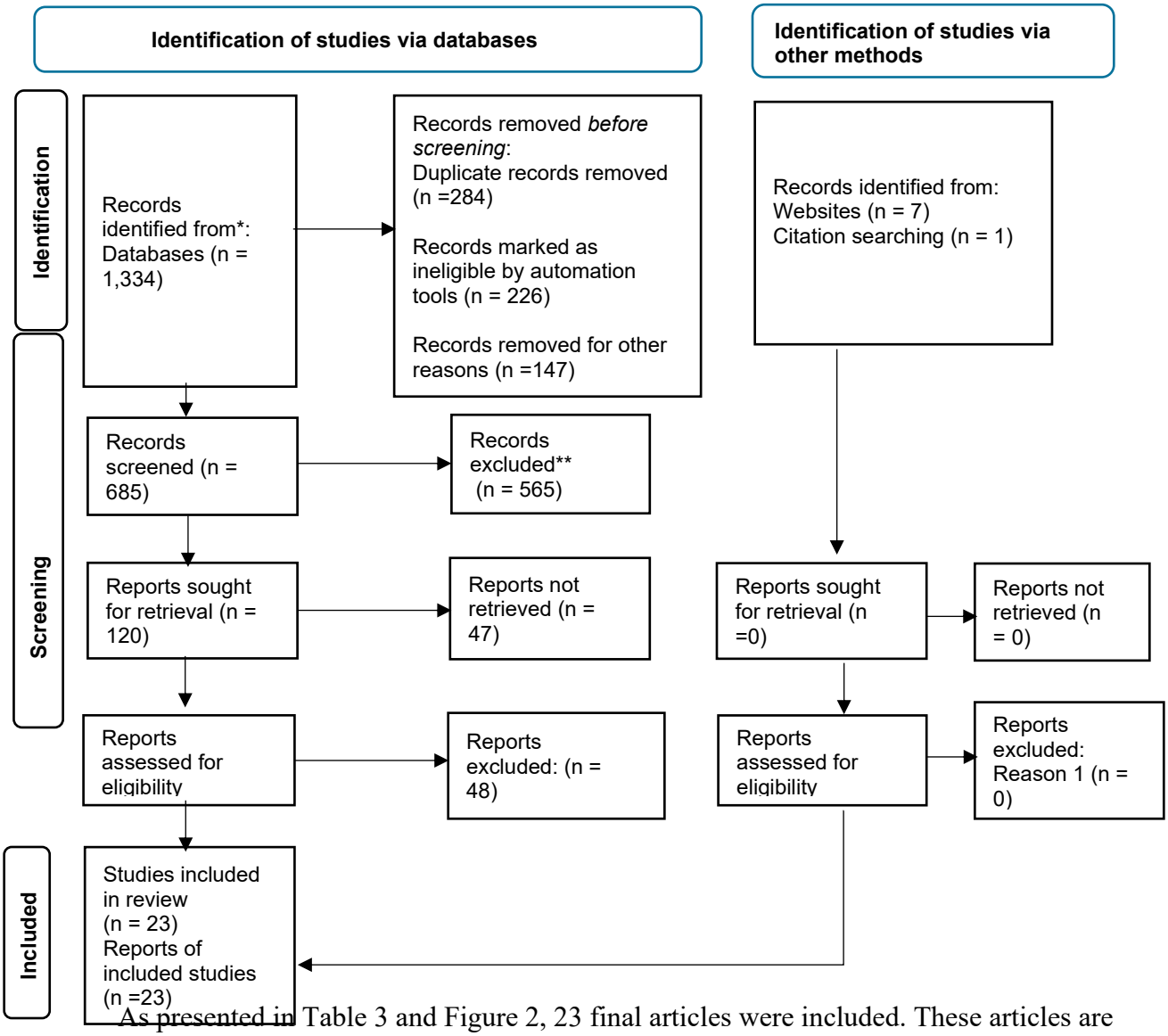
Table 3

Data Table

Category	Count
Records Identified from Databases	1,342
Records Screened	685
Reports Sought for Retrieval	120
Studies Included in Review	68
Records Removed Before Screening	20
Records Excluded	48
Total Articles Included	23

Figure 2

PRISMA Flow Diagram



As presented in Table 3 and Figure 2, 23 final articles were included. These articles are also detailed in Table 4.

Table 4

Themes and Research Objectives

Theme	RQs	Recommendations
Theme One: Technology-Specific Factors for MvT Integration for Technology Supporting EFL Students	RQ1	• Instructors must first determine what level of MvT is appropriate for the EFL student population (Kim et al., 2023). • Instructors require training to succeed in the application of MvT (Seyyedrezaei et al., 2024).
Theme Two: Student Role: The Role of MvT in Enhancing EFL Learning	RQ1	• Gamification helps students engage with learning content (Pinto et al., 2021). • MvT supports student learning by engaging students and reducing frustration (Islam et al., 2022).
Theme Three: Teaching Level: Guidelines for Instructors on Implementing MvT in EFL Education	RQ1	• Implementing training and policies designed to support instructors is needed (Fan et al.,). • Student engagement and socialization through MvT are a key benefit to student learning (Chen, 2024).

Appendix A is a tabular representation of the total articles included and presents citations, methodology and design, sample and population, findings and limitations, and the relationship to the research question. During analysis, each article was read several times to identify repeated ideas or keywords related to the research question. These ideas were coded by level, technology, student, or teaching, and grouped into broader categories that reflected similar findings across studies. Patterns that appeared consistently were reviewed and refined into the final three themes presented in this chapter. Codes that shared overlapping meanings were combined into larger categories, which were then compared across studies to identify common patterns. These categories formed the basis for the three themes discussed in this chapter. This process followed Whittemore and Knafl's (2005) approach to integrative analysis, emphasizing consistency and transparency in data synthesis.

The preceding sections also address the overview by presenting a synthesis of the findings by theme. As noted in the introduction to Chapter 4, a review and narrative discussion of the relationships between these findings and the guiding research question and objectives are presented at the end of this chapter.

Thematic Results

This section presents the key themes related to the research study and questions. Each theme is discussed as a synthesis, highlighting literature addressing student, instructor, and educator-level factors. The reviewed themes included (a) Technology-Specific Factors for MvT Integration to Support EFL Students, (b) The Role of MvT in Enhancing EFL for ELL Students, and (c) Guidelines for Instructors on Implementing MvT in EFL Education at HEIs.

Theme One: Technology-Specific Factors for MvT Integration for Technology Supporting EFL Students

The first theme focuses on technology-specific factors regarding the integration of MvT in education to help EFL students in their learning process. Research in this area shows the applicability of digital tools, which encompass multiple approaches like AR, VR, and AI-based systems. For example, Al-Adwan et al. (2022) conducted a nonrandom convenience sample of 64 students and a control group of 32 students. They found that the VR game titled *House of Languages* had a positive impact on student achievement and vocabulary acquisition. The application of the game *House of Languages* may be a recommendable technique for faculty to use when assessing new techniques in EFL education that reduce anxiety and improve learning.

In addition, Al Najdi (2022) also examined the application of Augmented Reality (AR) in the Saudi Ministry of Education to support education, using AR experiments, e-textbooks,

learning games, video clips, and TV channels. According to Al Najdi (2022), improving student engagement through MvT programs could consist of gamifying learning while creating an immersive online environment to overcome challenges associated with traditional learning environments. However, Al-Adwan et al. (2022) emphasized that the effectiveness of technology integration depends on the quality of the infrastructure, support, and student interest.

In another study (Al-Ansi et al., 2023), AR and VR technologies were examined by exploring a total of 1,536 articles selected for further analysis. According to Alpala et al. (2022), VR applications are within the scope of an experimental framework for implementing MvT procedures to support educational processes. MvT has exhibited outstanding promises in encouraging learning as well as language acquisition, and instructors who incorporate gamified applications via AR and VR may establish interactive intensive environments that encourage language learning (Alpala et al., 2022). According to Alpala et al. (2022), MvT enables students to personalize their experiences, such as choosing avatars and engaging in game-oriented activities. This may lead to a more enjoyable and engaging learning experience. They can also creatively introduce learners to topics such as nature, production, or art through digital classrooms in ways that will help in the understanding and retention of those subjects.

Similarly, Seyyedrezaei et al. (2024) performed a meta-analysis on the impact of technology in EFL learning and concluded that the inclusion of tools such as MvT can significantly enhance performance (achievement). Together, these studies indicate a promising model for technologically supported education at the tertiary level. Through the integration of IS, gamification, combined with personalization of learning, it has the potential to help address many issues that EFL students encounter and improve academic attainment.

Collectively, these studies indicate that MvT tools have real potential to improve EFL learning, but their success depends on how they are introduced and supported in ELL. Programs that connect clearly to learning goals and include interactive or gamified elements tend to produce stronger results than tools that only deliver information. Students show more confidence and greater language retention in situations where MvT is tied to communication-based tasks and instruction. The evidence also points to the need for stable infrastructure and reliable access, since technical difficulties or lack of institutional support often limit outcomes. In short, the findings on this theme show that technology itself cannot be a solution, but helps in creating realistic, low-pressure practice environments. This requires tools like MvT to be considered as a novelty that can help with teaching ELL, where there are clear objectives and supporting resources.

Theme Two: Student Role: The Role of Metaverse Technology (MvT) in Enhancing EFL Learning

The research associated with the second theme encompassed various procedures, techniques, and models that specifically focused on using language and location, creating digital environments, and employing techniques such as VR, AR, and AI-driven technologies to support EFL teaching (Almusharraf & Bailey, 2023; Apriani et al., 2024). Two studies focused on student-level factors specific to the role of MvT in enhancing EFL learning (Almusharraf & Bailey, 2023; Apriani et al., 2024). One study showed an adequate level of acceptance and utilization of MvT tools. English avoidance behavior, benefits, and foreign language proficiency were associated with the increased use of MvT tools (e.g., Google Translate). The application of MvT tools may support EFL language acquisition (Almusharraf & Bailey, 2023). Apriani et al. (2024) demonstrated a strong association between MvT and technology usage, particularly in

enhancing writing skills through ICT-based MvT learning. According to Apriani et al. (2024), incorporating an ICT program into an MvT program, such as a VR headset or an AR-guided program on a TV, can be supportive of practicing language and writing skills.

Virtual Reality and Information and Communication Technologies-Guided Tools.

Two studies demonstrate the ways in which technology-based tools, specifically VR and ICT, may contribute to overcoming difficulties experienced by learners of EFL. The first study by Asad et al. (2021) found that VR can enhance students' writing, reading, and communication. Through the use of VR headsets, learners could work on their language capabilities in an interactive and non-threatening space that was conducive to engagement while minimizing stress.

The second study by Bin-Hady and Al-Tamimi (2021) reported that when students learned language with technology-based learning strategies in informal settings, they increased their listening, speaking, and reading skills as well as vocabulary development. They observed that using game-based and interactive interfaces, but not limited to, web applications, AR, and VR, was effective in maintaining students' motivation and involvement.

Collectively, results from these studies indicate that immersive and technology-enhanced learning environments can facilitate a more enjoyable and effective ELL experience for EFL students by enabling them to train in realistic, interactive scenarios that emulate conversation in the real world.

EFL Student Results for VR and MvT.

Two studies have demonstrated that the use of VR and MvT applications through a VR headset has enhanced practical results for EFL students' learning, writing, and communication in ELL. Feng and Ng (2023) have shown that target word usage, lexical density, and other

approaches help improve learning processes when compared to those in the conventional classroom. Programs may include using MvT and VR applications through a web browser or on a TV.

According to Hazaymeh (2021), using web-based VR headset programs enabled most of the respondents (86.66%) to successfully acquire language proficiency through online distance learning, indicating a flexible and suitable learning environment (Hazaymeh, 2021). Some of the drawbacks included technical problems and the lack of physical interactions. Limitations included the limited application of MvT in EFL education, requiring further examination to improve differentiated learning preferences and needs.

Anxiety and Improving Engagement.

Two studies have identified that the application of MvT learning components for EFL students has shown promise in reducing anxiety and improving engagement (Kim et al., 2023). Kim et al. (2023) found some significant differences between the two groups of 45 EFL students while reporting on the advantages and disadvantages of MvT learning, including infrastructural and technological barriers.

According to Kim et al. (2023), the use of web and application-based programs designed for learning can reduce anxiety. Lee (2023) indicated that students enjoyed MvT learning, and technology improved their interactions and engagement. The MvT learning programs were implemented using web software in the classroom to track students' learning progress. Regarding student perceptions, the application of MvT is explicitly considered as a way to reduce anxiety, increase student participation, and create a low-pressure environment that fosters better student-level engagement and success (Lee, 2023).

The studies point to the same thing in different ways. MvT helps EFL students use English more often and with more confidence. It takes away some of the pressure that comes with trying to be right all the time. When EFL students can move around, talk, or write inside the setting, they focus less on mistakes and more on meaning. Games and short tasks work best because they provide a reason to use language instead of just learning about it. The programs that blend structure with open space seem to work better than those that are rigid. Even with a few limits or technical difficulties, EFL students stay involved. The overall pattern is that MvT helps EFL students feel safe enough to try, and that change in attitude makes learning stick.

Theme Three: Teaching Level: Guidelines for Instructors on Implementing MvT in EFL Education

The third theme focuses on teaching-level contextual factors, explicitly providing guidelines for instructors' implementation of MvT and EFL education based on previous explorations and assessments. Two studies found that ICT technologies were key to EFL student success (Akram et al., 2022; Biletska et al., 2021). Akram et al. (2022) examined policy changes, including resources, training, and professional development, which are necessary to incorporate ICT and address limitations in ICT infrastructure, tools, software, internet, and labs (Akram et al., 2022). Biletska et al. (2021) conducted an integrative descriptive review to understand training, future, and evidence-based practices for using technology in education, specifically for teaching EFL (Biletska et al., 2021). This included training that clarified how instructors could utilize MvT for EFL educational purposes. However, there was a need to improve practices that could enable instructors to overcome the barriers to successful implementation.

Five studies have found that the implementation of VR for instructors can be an effective method of support for educational purposes, but further support is required for effective

implementation (Parmaxi, 2023; Pinto et al., 2021; Wang et al., 2022; Wu et al., 2024). One study found that VR was an effective tool for language learning (Parmaxi, 2023). Pinto et al. (2021) demonstrated that the inherent gamification of VR can support learning a second or foreign language. Gamification can include objectives, goals, fun and creative characters, and an objective-based approach to learning.

Furthermore, according to Pinto et al. (2021), there is a need to explore educators' direct experiences to understand how to improve training for implementing technology. The third study showed five design strategies: three-dimensional multimedia content, hands-on interaction with physical learning materials, gamification, spatial mappings, and location-based features. Employing these strategies can support student learning through instructors' use of three-dimensional multimedia with advanced organizers (presentation strategy) and using location-based content with learners' self-exploration (discovery strategy). Additionally, motivation was enhanced by incorporating game mechanisms into the discovery strategy (Fan et al., 2020).

Information focusing on practices and recommendations allows instructors to implement MvT in ELL with EFL education more effectively.

The fourth study, through a meta-analysis of MvT and EFL literature, found the following themes: a) Instructional Design (ID) and performance technology hub, b) knowledge hub, c) research and technology hub, and d) talent and training hub. Issues needing to be addressed for educators included: a) infrastructure, business industry, and communication; b) technology access and equity; and c) user rights, data security, and privacy policy (Wang et al., 2022).

The fifth study explored the implementation of MvT for EFL learning acquisition. The meta-analysis identified key themes related to language education, including pedagogical design,

technical support, and psychological endorsement in the MvT (Wu et al., 2024). These findings suggest that changes in pedagogical design are necessary to enhance instructors' ability to implement MvT designs. Furthermore, the ability to improve technical support through training, resources, and professional development can improve instructors' buy-in for these technologies. The findings indicated that a need exists to support educational stakeholders (Parmaxi, 2023; Pinto et al., 2021; Wang et al., 2022; Wu et al., 2024).

In addition, evidence-based strategies, challenges, and instructor perceptions were identified across two studies (Huang et al., 2021; Lee & Hwang, 2022). One study, through a meta-analysis of literature, identified the following themes: (a) immersing learners into virtual worlds is the primary approach to language learning in AR and VR studies; (b) university students were the primary users of AR/VR technologies; (c) the significant research findings concerning the benefits of AR and VR included improvement of students' learning outcomes, enhancement of motivation, and positive perceptions towards using AR and VR; (d) AR and VR tools promoted language learning through providing immersive learning experiences, enhancing motivation, creating interaction, and reducing learning anxiety; and (e) implications identified from previous research included the needs of providing training for instructors, enlarging sample sizes, and exploring learner factors such as learner engagement and satisfaction (Huang et al., 2021).

The second study indicated that suitability was based on instructor preparedness, while pre-service training could improve pedagogical benefits (Lee & Hwang, 2022). The findings from the third theme offered enough information to establish a foundational understanding of teaching-level factors that are specific to implementing MvT and ELL education.

The studies indicate that instructors want to use MvT but often do not feel ready. Even when the tools are excellent, many run into problems with time, training, or access. It is not a lack of interest, but actually, a lack of support. Instructors who understand the tools use them in better ways and connect them to what students already do in class. When training is practical and part of real lessons, instructors feel more confident, and it shows how they teach. Most of what limits success is not the technology itself, but the setup around it. In the end, how instructors use MvT matters more than what kind of program they have.

Relationship of Themes to Research Question

This section discusses the research objectives and their relationship to the identified themes. Table 4 summarizes the relationship between the reviewed citations and the themes, which are described narratively in this section.

Together, these themes respond directly to the guiding research question by showing how MvT can enhance ELL outcomes in HEIs for EFL students. Each of these themes shows a different process that is part of the technology adoption: technology design, student interaction, and teaching practice. This provides a full picture of how MvT can be used in EFL education. Details regarding how each theme addressed the research question through the integrative literature review approach are provided. For each research objective, the associated theme is discussed, providing context and foundational knowledge specific to supporting MvT integration for EFL at a higher education level.

The relationships shown in Table 4 are explored in greater detail below. Each theme is discussed with its connection to the research question, showing how the findings from the literature fit together to support MvT integration in higher education in ELL. Together, the three themes provide a connected understanding of how technology, students, and instructors interact

in MvT-based learning. Each theme focuses on a different level of the process, but all point to the same outcome, where learning improves when tools, learners, and instructors work in alignment.

The first theme focused on the importance of technological-level factors in addressing the needs of EFL students. The first research question inquired about the application of MvT in educational settings and explored studies with a focus on EFL students working to enhance their ELL skills (Al-Ansi et al., 2023; Al Najdi, 2022). Based on the information garnered from the first theme, a need exists for improving technological interventions, such as MvT, to overcome the difficulties that Saudi Arabian students face. In particular, overcoming challenges such as limited English exposure and weak communication skills can lead to the improvement of evidence-based practices that implement technologies like MvT for ESL students (Alpala et al., 2022; Seyyedrezaei et al., 2024).

The second theme also provides contextual knowledge that addresses the research question, offering insights into how digital tools and the features of MvT, AR, VR, and AI-based applications can enhance language learning experiences (Almusharraf & Bailey, 2023; Asad et al., 2021; Hazaymeh, 2021). The implementation of MvT can lead to improvements in instructional strategies, learner engagement, and instructor support. When viewed with the first theme, this indicates that strong technology alone is not enough; it must be paired with student-centered design that encourages participation and confidence. Therefore, themes one and two address research question one by providing knowledge specific to the use of MvT in educational settings and its potential applications in enhancing ELL skills among EFL students at HEIs.

The research question focused on identifying recommendations for instructors and HEIs that want to use MvT with EFL students. The third theme addresses this directly by offering

guidelines for implementation and pointing out the importance of instructor training, institutional support, and realistic expectations. This theme builds on the first two by showing that instructor readiness and instructional context determine how effectively technology and student engagement come together in practice. Based on the third theme, improvements in language learning are connected to MvT as far as they provide a virtual environment that facilitates student engagement, addresses weak communication skills, and reduces language anxiety. Researchers demonstrated the ability to utilize real-world language applications through MvT, which can personalize the learning experience, enhance engagement, and potentially support academic outcomes.

The third theme also addressed the research objectives by providing guidance that could be used as actionable approaches for instructors. Specifically, this refers to improved lesson planning approaches, variation in assessment strategies, and challenges associated with technical difficulties in ELL. Although this review identified three main themes rather than four, the collective findings revealed consistent recommendations for instructors: clear learning goals, structured training, and support systems that allow for experimentation without penalty. While barriers such as lack of infrastructure and training remain present, the implementation of MvT for ELL in HEI environments, as shown through all three themes, comes with various practical, evidence-based recommendations for how higher education instructors can effectively integrate MvT into ELL instruction.

Summary

This chapter presented the results of the integrative literature review and described the three main themes that emerged from the analysis. The findings showed how technology, student engagement, and instructor readiness work together to influence the success of MvT in EFL

education. Each theme connected back to the central research question by explaining how MvT could be used to improve learning outcomes for EFL students in higher education. The discussion also highlighted how these factors depend on one another; technology supports learning only when students are engaged, and instructors are prepared to use it well. The themes collectively paint a comprehensive picture of the necessary elements for successful MvT integration. The next chapter discusses these findings in relation to existing research, theory, and implications for practice.

Chapter 5

Discussion and Conclusions

This chapter discusses what the literature review revealed about Metaverse Technology (MvT) in education, especially for English as a Foreign Language (EFL) students, for English language learning (ELL) in Higher Education Institutions (HEIs). The goal here is to interpret the findings from Chapter 4 and connect them to existing research and theory. It also provides practical guidance for HEI instructors who want to use MvT to help EFL learners strengthen their English skills.

EFL education at Saudi Arabian HEIs is challenged by several problems, such as students struggling with English proficiency, ineffective ID, and unwillingness to adopt new technology. An integrative literature review was needed to provide a comprehensive analysis of different types of research and methods (Akram et al., 2022). Since MvT is still a developing area, this integrative approach works well for pulling together both conceptual ideas and actual research findings. It also simplifies the process of applying global research findings to specific educational settings. Research focused on MvT is continuously growing, so spotting beneficial patterns and connections can be important and helpful to instructors.

Chapter 4 showed the results from the synthesis of 23 studies that met the criteria for inclusion. Three main themes emerged from the analysis: (1) what technology factors matter when integrating MvT to support EFL students, (2) how MvT affects student engagement and language learning, and (3) what guidelines instructors should follow when implementing MvT in EFL classes. The analysis examined the second and third themes more closely by looking at student and teaching levels, respectively. This chapter builds upon those findings by discussing their alignment with previous research and theoretical frameworks, highlighting implications for practice, and addressing limitations and recommendations for future research.

Discussion of Findings

The identified themes were divided into teaching, technology, and student levels. When thematically evaluating the findings, adherence to Whittemore and Knafl's (2005) method of systematic review analysis led to the emergence of themes based on the level to which MvT could be applied, rather than specifically in congruence with each of the two original research objectives. The first theme focused on technology-specific factors at the level of MvT integration as a tool for effectively meeting the needs of EFL students. The second theme focused on student-level factors specific to the role of MvT in enhancing EFL students in ELL. The third theme focused on teaching-level contextual factors, explicitly providing guidelines for instructors' implementation of MvT within EFL education based on previous explorations and assessments at HEIs.

Together, these three themes directly addressed the single research question by illustrating how MvT could influence learning outcomes through its technological features, its impact on EFL student engagement, and its application in teaching practices. The discussion in this section aligns with the research objectives, as each theme directly contributes to the main research question. The goal was to look at how the findings from each theme were connected to what was asked in the study, and how they worked together to answer that question.

The results also relate closely to Vygotsky's (1987) idea that learning happens through interaction. MvT allows EFL students to work together, communicate, and use the English Language in realistic situations. This supports the same concept as the zone of proximal development, where guided activities help EFL students move from supported learning to independent use of the English language.

Each theme in the next section is compared with existing studies and practical examples. This keeps the discussion connected to the research question and points to what the findings mean for instructors who want to use MvT in higher education.

The Guiding Research

Results related to the guiding research question, **"**What evidence-based guidance can be provided to EFL instructors in higher education about ways to use MvT that lead to increased learning?" showed that many studies were available that contained findings regarding MvT and its use for EFL skill development (Al-Ansi et al., 2023; Alfadil, 2020; Al Najdi, 2022; Seyyedrezaei et al., 2024). This question framed the entire review, ensuring that the literature was not only described but also evaluated for its practical implications for instructors. The role of this technology in achieving this outcome is intuitive, and it is clear that MvT is one of many forms of educational technology that can help foster improvements in a specific skill, such as ELL mastery (Seyyedrezaei et al., 2024).

Several other studies located in this integrative review have confirmed that tools and features related to MyT can help improve ELL skills. For instance, the Al-Ansi et al. (2023) study analyzed AR and VR technology by synthesizing 1,536 articles related to these tools. MvT holds potential applicability for education and language acquisition, although additional research is needed (Alpala et al., 2022). MvT remains in development, and the evidence documenting its impact has varied significantly in quality and methodology. These methods, which are often reliant on self-reports and surveys, suggest that future research could benefit from studies following a more experimental or longitudinal methodology. These can be more rigorous in testing causal relationships like those between MvT and skill development.

The first theme regarded the importance of technological level factors for addressing the length of EFL students' education. This theme aligned closely with the guiding research question, which pertained to the use of MvT in educational settings. Evidence has shown that this tool has been applied and explored in studies involving EFL students to enhance their ELL skills (Al-Ansi et al., 2023; Al Najdi, 2022).

Therefore, based on the evidence, the response to the guiding research question is that MvT has been utilized in peer-reviewed research and has made a significant contribution to improving skill development. Several individual studies helped to confirm prior literature and have addressed the guiding research question. Altogether, these findings underscore key recommendations related to the topic. EFL instructors at HEIs must start experimenting with MvT as a supplemental tool, especially as it relates to students expanding their vocabulary and staying engaged in lessons. However, instructors must also be mindful of the current methodological limitations of the research and proceed with caution.

Several syntheses have been conducted before this integrative review, giving an overview of the current state of technology use in education, and specifically MvT-based education tools. The researchers also demonstrated a significant correlation between the type of technology and the overall impact of its applications in education (Seyyedrezaei et al., 2024). Thus, technology can significantly impact learning and educational outcomes in the context of EFL students, and the future development of MvT can further change and enhance learning capabilities for ELL. This finding is also connected with the constructivist and sociocultural theories, emphasizing that the methods for mediating learning would shape both cognitive processes and outcomes.

In practice, this means that instructors must carefully match the MvT platform they choose with their learning objectives, rather than assuming all tools will yield equal benefits.

Themes one and two from the thematic analysis served to address the first research question by providing novel insight into the specific use of MvT in educational settings and its applications with EFL students related to optimizing ELL skills. Themes and related literature that proved advantageous in responding to the second research question of this study are discussed in the following sub-section.

Objective 1

The aim of the first research objective, "What teaching practices do experts believe are necessary for higher education instructors to use MvT with EFL students," was to gain an understanding of the extent to which technologies associated with MvT not only foster improvements in skills about EFL or ELL, but also the combined motivational and attentional advantages. Specifically, the first research question required that suggestions be generated for instructors and higher education institutions who want to use MvT with EFL students to improve their level of engagement and practice. Within the context of the second research question, themes three and four provided the evidence that was needed to address this particular question.

However, several of the reviewed studies contributed to the emergence of these themes (e.g., Almusharraf & Bailey, 2023; Apriani et al., 2024; Asad et al., 2021; Bin-Hady & Al-Tamimi, 2021; Feng & Ng, 2023; Hazaymeh, 2021; Kim et al., 2023). Thus, MvT-associated tools appear to be sufficient for fostering engagement in students in higher-education settings, and there is support for their use in the development of EFL skills. MvT can be used to foster engaging EFL content for Saudi Arabian students.

Several other studies were beneficial in addressing this research question, which contributed to the emergence of the related themes. For instance, Apriani et al. (2024) investigated the potential of MvT in enhancing writing skills based on students' knowledge,

strategies, and awareness. Iltaza and Susila (2013) conducted a study on English students at Islamic universities. The results indicated that the learners had a moderate to fairly high level of metacognitive knowledge and strategies. The use of MvT was aimed at facilitating learning in a more interactive and playful environment, where students could practice their language skills and build better strategies for being learners (Iltaza & Susila, 2013).

The findings indicate that MvT can be used to both support ELL and engage EFL students in language learning. This finding corresponds with self-determination theory in that, when EFL learners are given a sense of control (autonomy)and the ability to succeed (competence), they are more motivated to learn (Iltaza & Susila, 2013). By gamifying and personalizing tasks, MvT can meet the needs of a variety of EFL students in a way that traditional teaching methods often do not. One practical way instructors can use MvT is by adding game-based elements. This boosts EFL student engagement and helps them become more aware of how they are learning.

There is enough consistent research supporting educational tools with MvT that instructors should feel confident using them in their classes at HEIs. Asad et al. (2021) recently reviewed all the evidence on metaverse-related technology, focusing especially on VR. They found that VR works as a teaching tool in several ways - it can gamify learning, let students practice in mock online environments, and help with language learning through simulated spaces.

More instructors are adopting and integrating VR into their teaching, which reflects the findings of the related research (Al-Ansi et al., 2023; Huang et al., 2021). VR and each of the individual tools aligned with the MvT have been shown to foster improvements in skills associated with a wide range of academic domains while engaging and capturing users' interest

(Alpala et al., 2022; Anderson & Rainie, 2022; Bansal et al., 2022). In addition, MvT helps EFL students communicate better, improve their reading and writing, create new ways to learn socially, and generally supports more hands-on, experiential learning (Apriani et al., 2024; Bansal et al., 2022).

Social constructivist theory explains why this works - people build knowledge by interacting with each other. (Nuthall, 2002). As a result, instructors should focus on giving EFL students chances to use MvT together in groups. For example, it can be used for partner simulations, shared projects, and other similar tasks rather than for solitary practice, so that its use maximizes engagement with peers.

The support for MvT tools in improving knowledge and skills for EFL learners was unequivocal in this study. Vocabulary skills improved more than grammar and pronunciation via this tool, and the reason for this discrepancy is likely related to statistical noise in the design and analysis (Bin-Hady & Al-Tamimi, 2021). Results showed that group comparisons were not statistically different in general oral performance, though technology-enabled methods improved performance in some speaking skills and reduced anxiety (Chen, 2024). The experiential nature of VR may foster greater self-efficacy, helping reduce students' sense of anxiety and stress. This leads to a clear recommendation for practice. The notion that instructors should consider integrating MvT into areas where anxiety is especially high, such as oral presentations or speaking tasks, since VR allows practice in a safe, lower-stakes environment.

Thus, technology associated with MvT may be superior to traditional educational methods. This can also be advantageous in circumstances such as pandemics, where social distancing forces remote education to replace traditional in-person environments. Hazaymeh (2021) investigated the use of MvT for EFL online during COVID-19. The author found that the

majority of respondents acquired ELL proficiency successfully through the online format. Respondents also reported appreciating the flexible and suitable learning environment. However, the drawbacks mentioned in the sample included technical problems and a lack of physical interactions. Thus, addressing these drawbacks can serve as an additional recommendation emerging from the findings of this study, and can be shared with instructors seeking to integrate MvT.

There was solid evidence that supported the possible use of MvT in enhancing ELL skills. Kim et al. (2023) analyzed the learning activity of 45 EFL users, dividing them into two groups: one group used traditional teaching procedures, and the other the MvT-based learning process. The results revealed no significant differences between the two groups, verifying that MvT was equally effective as traditional methods. However, when students began discussing their own experiences, they shared some common challenges, such as a bad internet connection and limited access to technology. This implies that if MvT is to be successful, instructors and institutions must reduce these technical and infrastructure challenges.

In addition, Lee (2023) also studied EFL learning with MvT among 72 Korean students. Students said they liked learning with MvT and that it made them more interactive and engaged in class. This indicates that MvT can help EFL students learn knowledge and skills in a way they actually enjoy.

Based on the findings from the studies related to this research question, it is clear that MvT can help foster engagement. While many barriers remain present and have been frequently mentioned (e.g., lack of infrastructure, limited training for educators), the advantages appear to outweigh the costs. Additionally, students and educators at HEIs can be expected to possess the cognitive skills needed to learn new technologies. The implication for higher education is that

instructors should begin gradual adoption, focusing on pilot projects or specific modules rather than redesigning whole courses or teaching approaches, while also advocating for institutional support to address infrastructure barriers.

Objective 2

The aim of the second research objective, "What are experts' perceptions of the current scholarship of MvT in EFL classrooms?" was to frame the impacts of MvT on ELL as being more effective, rather than simply satisfactory or equally as effective as traditional learning. For MvT to be of benefit and value, it must be superior to traditional methods in some way, either by enhancing skills and learning to a greater degree or doing so in a more efficient, time-effective, or cost-effective way (Li, 2024). There is debate regarding the extent to which MvT is superior to traditional learning versus simply equal to it, as indicated in the studies included in this review. Based on the debates surrounding MvT's precise role and impacts, Akram et al. (2022) found in their qualitative review that effective policies are needed to incorporate Information and Communication Technology (ICT) tools into contemporary education. They also found that there was a significant need to address limitations in ICT infrastructure, tools, software, internet access, and laboratories.

Only by addressing these limitations can MvT-associated technologies begin to realize their full potential as educational supplements for students learning English. This suggests that system readiness, and not just individual instructors showing enthusiasm, is important to successfully implementing MvT. This aligns with the concepts in the diffusion of innovation theory, which places emphasis on the importance of institutional infrastructure for adoption.

Biletska et al. (2021) performed an integrative descriptive review of how ICT can facilitate EFL learning. They aimed to identify workable, evidence-based strategies that

instructors might use in employing such tools. The reviewed studies used different techniques and showed conflicting results, which did not allow for a definite universal recommendation. Nevertheless, they found that MvT and related tools used for the empowerment of learning were used efficiently in classroom practices without reported risks or detrimental effects (Biletska et al., 2021).

In addition, the review also recommended long-term studies to investigate the impacts of prolonged use on learners' social skills or motivation. The open-ended and flexible nature of MvT emerged as an obvious advantage, as it gave instructors the option to individualize; they could modify materials and instructor pedagogy to meet individual students' learning styles (Biletska et al., 2021). Instructors could keep students' attention and interest by using both direct instruction and discovery methods. Based on these findings, instructors are encouraged to utilize MvT as a supplement to traditional methods rather than a substitute by using its novel features to complement face-to-face, socially constructed learning (Biletska et al., 2021).

AR and VR can help improve learning, enhance motivation, and foster more positive perceptions toward using educational technologies. Huang et al. (2021) evaluated the use of AR ignand VR for ELL skill development based on the findings of 88 articles that covered both educator and student perspectives. According to their findings, immersing learners in virtual worlds was the most effective approach to language learning in AR and VR studies. The authors also found that university students were the main users of AR or VR technologies, and there were significant research findings concerning the benefits of AR and VR.

Based on this analysis, a need exists to examine the use of these tools from the perspective of instructors, as well as to address limitations in the design and methodologies of extant research (Huang et al., 2021). Furthermore, AR and VR tools promoted ELL by providing

a more immersive learning experience than what could be found in a traditional setting, making this one of the first studies to demonstrate such an effect. VR and AR appear to be universally beneficial in enhancing motivation, creating interaction, and reducing learning anxiety.

From a cognitive load theory perspective, this is particularly important: immersive settings reduce extraneous load by situating tasks in meaningful contexts, making learning more efficient. (Skulmowski & Xu, 2022). A practical takeaway is that instructors should use AR/VR specifically for tasks where context aids comprehension, such as vocabulary in cultural scenarios, rather than for rote grammar practice. (Annamalai et al., 2023). Implications identified from previous research include the need to improve instructor training, increase sample sizes for future studies, and to further explore how these tools influence engagement and satisfaction.

Lee and Hwang (2022) explored the adoption and implementation of VR and how its use helped in improving student learning outcomes. They found that the effectiveness of these tools is primarily based on instructors' preparedness and thus, training the instructors on proper use and development, and creating environments with the tools are critical. Fortunately, the authors found that pre-service training can improve pedagogical benefits. Thus, instructors should be trained to use MvT and not expected to understand them without formal education. This connects directly to Vygotsky's Zone of Proximal Development (ZPD). Just as students need scaffolding, instructors also require scaffolding through structured professional development to reach their potential for integrating MvT.

Recent studies have increasingly focused on the role of immersive and gamified technologies in enhancing second-language acquisition. Parmaxi (2023) also provided evidence that supported the second research question, finding consistent improvements in ELL skills. Additionally, Pinto et al. (2021) explored the implementation of technology in language learning

using an integrative review approach. The review of articles demonstrated that the inherent gamification of VR can support learning of a second/foreign language.

However, a lack of educator perspectives limits the understanding of technical implementation for pedagogical purposes. Wang et al. (2022) and Wu et al. (2024) also conducted research that generated evidence supporting the conclusion that MvT technologies can help improve knowledge and skills among EFL students. This finding was consistently demonstrated, and it is recommended that tools associated with MvT, such as AR and VR, be utilized in education once instructors are trained in their functionality. Future research should, therefore, prioritize using mixed-method designs, rather than survey-heavy or self-report studies, so that a richer evidence base is built related to both student outcomes and the pedagogical process.

Implications for Practice

Results from this study are of potential benefit to educators, researchers, instructors, and educational leaders who are involved in learning English as a second language. Current literature offers strong evidence that mixed-reality and virtual worlds can promote greater learner engagement, motivation levels, and access to context-rich aspects of the target language when implemented with a clear pedagogical purpose (Lan, 2020; Parmaxi, 2023). Concurrently, it has been warned that as a technology, immersion does not promise benefits straightforwardly; its outcomes are dependent on the closeness to learning purposes and task design and assessment (Lan, 2020; Parmaxi, 2023). Indeed, from this perspective, the current work does not challenge but rather supports, that MvT is inherently effective, but rather asserts that its pedagogical value is realized through strategic instructional choices.

One of the major implications of the findings is that decisions about adoption should be based on whether the pedagogy is clear, not whether the technology is available. Lan (2020) has noted the tendency for educators to explore or employ technology-enhanced language learning with new tools and approaches in ways that are poorly connected to course outcomes, limiting their effectiveness in supporting language development. (Lan, 2020; Shadiev & Yang, 2020). Instructional Design (ID) literature provides a concise explanation of how this happens, that engaging learning experiences are often peripheral to learning when learning objectives, learning activities, and assessment do not align with one another (Biggs, 1996; Wiggins & McTighe, 2005).

In this way, strategic use means an intentional alignment, that targets the design of immersive affordances that further language outcomes and embedding them directly in the sequence of instruction, rather than as add-ons. Frameworks for technology integration also help, such that when it comes to effective classroom use, the emphasis is on teachers planning tech use to align pedagogic strategies with content, rather than viewing tech as merely serving as a neutral add-on (Mishra & Koehler, 2006).

Thus, the findings of this study directly resonate with the literature review gap, suggesting that faculty do not always understand how to strategically incorporate MvT, resulting in intermittent or special use. The findings are also consistent with many extant technology adoption huddles, which explain why faculty perceive value but have difficulty using MvT.

The Technology Acceptance Model (TAM) is based on perceived usefulness and perceived ease of use, where barriers to ease of use can limit continued use, even if usefulness is high (Davis, 1989). Under the current circumstances, it may be that instructors see an

immersive environment as something that would motivate EFL students, but perhaps feel such environments are too challenging to work pedagogically in a structured way without preparation and practice. This highlights the need for professional development that focuses on more than just technical maneuvering, such as lesson planning and goal setting.

Another suggestion is scaffolded participation for both instructors and EFL students as a mechanism to implement successful MvT. Sociocultural learning theory posits that new students acquire competencies through guided participation and scaffolding that facilitates the gradual internalization of new skills. (Vygotsky, 1978). The general application of this principle, while noted among students, is pertinent to the practical requirements detailed in the literature. Consequently, time-limited guided orientation activities mitigate uncertainty and prevent cognitive overload, thus fostering greater comfort for both instructors and students in engaging with immersive processes. This scaffolding is especially useful in EFL classrooms, where EFL students must simultaneously negotiate linguistic and interactive demands within the context of an immersive learning environment.

Finally, the implications of the findings extend beyond single instructors. They concern ID assistance and organizational arrangements. The study of virtual reality in language learning reinforces the fact that for sustained use, strong support mechanisms, including training, access to resources and evaluations, should be applied consistently (Parmaxi, 2023). Professional development, including instructional designers, in higher education is often organized within teaching and learning centers or faculty development units, where this role emphasizes designers as pedagogical counterparts who are positioned to help faculty align technology use with course results (Biggs, 1996; Mishra & Koehler, 2006).

Taken together, these findings suggest the educational value of MvT lies less in the technology per se than in the instructional and institutional processes of MvT implementation. The subsequent subsections, therefore, involve implications for (a) instructors' practice, (b) instructional designers and academic support, and (c) institutional policy and sustainability, and they lead to the operational guidelines thereafter.

Implications for Instructors' Practice

The findings suggest that EFL instructors need pedagogically grounded guidance on how to strategically integrate MvT in EFL courses, not merely employ it as a supplementary or discovery tool. Results show that the instructors find immersive environment motivating and engaging but have difficulty expressing how such an environment fits into course aims, language goals, and assessment practices. This result directly mirrors the perennial status of technology-mediated English language learning research, the novel technologies are added into the curriculum with insufficient design, and fit poorly with the instructional process (Lan, 2020; Shadiev & Yang, 2020).

In addition, ID literature offers a valuable perspective on this challenge. According to the constructive alignment theory, good teaching is a function of consistency between what teachers want students to learn (outcomes), how they attempt to learn it (activities), and how they are assessed on that learning (Biggs, 1996). When integrating MvT activities as standalone experiences (such as single virtual visits or exploration simulations), it may stimulate interest for EFL students, but they do not provide sustained support for language learning. Strategic use, on the other hand, refers to selecting immersive affordances that are specifically facilitative of goals for communicative activity and situating these within sequenced instruction. The results

indicate that there is awareness among the instructors of MvTs potential, although they are not provided with a roadmap on how to align teaching and learning in practice.

The implication is reinforced in systems of technology integration frameworks. Mishra and Koehler's (2006) framework for Technological Pedagogical Content Knowledge (TPACK) suggests that practical applications of technology arise not from an exclusive focus on technological knowledge, but a broader integrated knowledge of content, pedagogy, and technology. Consequently, in relation to MvT, this indicates that instructors must comprehend the functionality of immersive platforms and evaluate their contribution to ELL acquisition processes pertinent to EFL contexts.

The findings indicate that in the absence of this kind of composite knowledge, instructors often concentrate more on the technical operation or surface engagement, not the pedagogically important employment of MvT in ELL courses. This requires conscious instructional preparation that positions MvT as a method for attaining ELL outcomes rather than an objective in itself. The facilitators should first look at communication competencies (e.g., oral engagement, pragmatic awareness, collaborative problem-solving) and then examine if immersive environments give unique affordances particular to developing these talents. This is an approach that shifts the instructor’s focus away from adopting experimental tools toward purposeful design, addressing the strategic use gap highlighted in the literature review and confirmed by the findings.

Scaffolding, Guided Orientation, and Instructor Confidence.

This outcome has underscored the significance of scaffolding and directed orientation for both instructors and EFL students. Results suggest that both instructors and EFL students need short, structured experiences in immersive spaces before fully incorporating them into instruction. In the absence of such preparation, respondents expressed feelings of ambiguity,

cognitive overload, and lack of confidence, all of which are potential threats to effective instruction and learning.

This implication is well taken from the sociocultural learning perspective. Vygotsky (1978) introduced the concept of the Zone of Proximal Development (ZPD), describing the context where students develop new skills through guided interactions with a more knowledgeable individual. While the principle was originally used in students' learning, the results of this study imply that it is a valid theory in relation to instructors who are faced with new technology in EFL courses. If instructors must apply MvT without modification or pedagogical support, they are effectively positioned outside their own ZPD and adopt a more experimental, trial-and-error approach.

In addition, studies on real-world immersive language learning highlight the need of staged engagement. Lan (2020) claims that environments that are immersive tend to succeed when learners have phases before they can work on complex tasks, which introduce them to navigation mechanisms, interaction patterns, and communicative expectations. Parmaxi (2023) states the same, that both teachers and students require time to acclimate to virtual settings, which can decrease anxiety and cognitive demands that are unrelated to language learning. These results corroborate this study that short, guided sessions can become a crucial transition between technological access and authentic instructional use.

Consequently, instructors should specifically create low-stakes introductory activities when applying MvT in the classroom. These will incorporate guided walkthroughs, straightforward interaction tasks, or observational activities designed to encourage EFL students to focus on domain learning prior to engaging with a linguistically challenging task. This sort of scaffolding not only helps to develop learning in students, but it also trains instructors in how to

build confidence to operate within a highly immersive environment, facilitate communication, and anticipate likely barriers. Over the long term, this strategy may lead to more instructional fluency and support MvT integration over more course iterations.

Collaboration and Communicative Language Use in MvT Environments.

The results also emphasize the role of collaboration as a device by which MvT facilitates EFL learning. Thus, instructors described greater engagement and perceived learning value in immersive activities that demanded that students use ELL with peers to communicate a shared meaning or to work toward common goals. This is consistent with research in EFL that ELL is socially mediated and constructed through interaction (Shadiev & Yang, 2020).

In addition, collaborative learning has been perceived as the focus of communicative ELL teaching, especially in situations where EFL students are required to use technology to perform real-life tasks. Shadiev and Yang (2020), for example, posit that technology-based environments are best used to support interaction rather than individual practice, since cooperative tasks provide opportunities for feedback, clarification, and meaning negotiation among interlocutors. Immersive environments are especially useful in this respect, as they let EFL students participate in shared spaces that recreate real-life communicative situations.

In addition, they suggest that when collaboration is purposefully built into MvT activities (e.g., role-based simulations, problem-solving tasks, group discussions), EFL students are more likely to engage in ELL as a functional communicative resource rather than as an object of study. This is conducive to the strengthening of communicative skills and consistent with sociocultural paradigms that emphasize meaning-focused interaction over decontextualized drill. Engagement theory also supports this conclusion by suggesting that genuine learning is generated through

active participation, cooperation, and authentic task involvement (Miliszewska & Horwood, 2006).

In particular, for instructors, that means MvT activities should be framed in terms of shared goals and that explorations should not be an individual focus. Tasks have to be reciprocal between students, have communicative roles that must be clear, and must result in something no one can do on their own. These design choices ensure that immersive environments contribute directly.

Moving Faculty Practice from Experimental to Sustainable Use.

The findings indicate that practice is crucial for whether MvTs as an experiment will endure or become sustainable. For instructors, if immersive tools were used, planned, or they couldn't see the clear pedagogical benefit of using them, they questioned the investment of time and their relevance to their curriculum. This is consistent with the broader higher education technology adoption literature, which suggests that innovations are less likely to persist if they remain peripheral to day-to-day teaching practice and are seen as optional add-ons (Parmaxi, 2023). Sustainability through the instructor lens is not just maintaining continuing, sustained access to the technology in question, but maintaining instructional practices, keeping aligned assessments that instructors are confident have pedagogical value.

Therefore, study indicates that when instructors can simplify how the immersive activities are participating in support of the desired learning objectives and feel in control of both technical and pedagogical aspects of integrating MvT in the classroom, it is more likely for them to integrate MvT effectively. This further supports the power of intentional preparation, collegial task design, and focus on program goals as core elements of sustainable practice. Consequently, these implications suggest that the effective integrating MvT into ELL by

instructors in EFL settings is contingent on planning effectively, scaffolded engagement, and co-constructed task design, and a move from trial-based implementation to pedagogically inspired implementation. By doing so, instructors can eliminate the novelty-driven application and leverage immersive technologies as integral components of ELL.

Implications for Instructional Design and Academic Support

The study's findings suggest that for MvT to be sustainably integrated into EFL higher education, the focus should not just be on individual instructors performing independently, but rather on instructional design and academic support systems rooted in teaching innovation. Despite instructors' interest shown towards them and the recognized potential associated with the enhancement of motivation and use of EFL, results reveal a lack of recommendations and pedagogical orientation from publishers regarding this issue, along with scarce training on its integration, which hinders their strategic use.

However, the aforementioned has been the scenario in higher education, where new technology that was used to address teaching support systems has not been sufficiently interfaced with existing instructional services (Parmaxi, 2003). This has not been widely adopted and has little instructional value. Most of the time, instructor development takes place at the college or university level, at least through a college, instructor-based teaching and learning center, or equivalent academic support unit.

These configurations are likely to be essential in defining whether and how instructors adopt new technology, or how innovations evolve beyond the innovation-implementation interval. This study indicates that the absence of common pedagogical assistance causes instructors to participate in their own experimentation with technology through self-learning.

Although the experiment's novelty should be beneficial, it often turns into a show spectacle that is disconnected from curriculum and assessment design.

This study is extended by the literature on instructional change, which emphasizes that sustained use of innovations is facilitated through opportunities for structured reflection, practice, and feedback to help instructors align new tools with the aims they have for students (Biggs, 1996). These configurations are likely to be essential in defining whether and how instructors adopt new technology, or how innovations evolve beyond the innovation-implementation interval. This study indicates that the absence of common pedagogical assistance causes instructors to participate in their own experimentation with technology through self-learning. Although the experiment's novelty should be beneficial, it often turns into a show performance that is disconnected from curriculum and assessment design.

These outcomes reflect a collaborative model of support. In this strategy, instructional designers collaborate with instructors to facilitate curriculum alignment, organizing assignments and activities in accordance with curricular objectives. Therefore, instructors remain responsible for their discipline content and pedagogical decisions. The second comes from the TPACK framework, which posits that whole integration of technology is contingent on collaboration among these domains rather than mastery of technology alone (Mishra & Koehler, 2006). This collaboration is especially important in EFL contexts, as instructors must concentrate not only on immersion types but also on facilitating environments for ELL engagement and interaction, as well as achieving proficiency goals.

The results also suggest that continued academic support is necessary to maintain long-term integration of MvT. Research in immersive learning environments highlights that sustainability is based on infrastructure, ongoing professional development, and evaluation and

refinement (Parmaxi, 2023). Instructors encountered several repeating technical difficulties, limited access to reliable platforms, and insufficient opportunities for reflective practice, which contributed to their lack of confidence in incorporating MvT into the classroom. These difficulties suggest that, without instructor development initiatives to promote support for MvT during its testing periods, instructors may revert to familiar contexts, while recognizing the potential advantages of immersion.

Instructional designers and academic support units play an essential part in addressing these problems by creating feedback loops that allow instructors and students to evaluate MvT-based activities, reflect on their efficacy, and make necessary refinements. These processes align with educational innovation paradigms that emphasize continuous adaptation over singular execution. Academic support frameworks can facilitate the move from experimental tools to integrated elements of EFL instruction by assisting instructors in evaluating effective practices, ineffective strategies, and the underlying reasons, as the adoption of immersive technologies in the environment grows.

Combined, the results show that ID and academic support are crucial mediating factors for successful MvT implementation in the EFL higher education setting. Improved integration involves more than simply accessing technology; it requires coordinated pedagogical support, collaboration between instructors and instructional designers, and a commitment from institutions engaged with MvT to prioritize sustainability over experimentation. By improving these support structures, higher education institutions can assist instructors in transferring from exploratory use to intentional, effective integration of immersive technologies.

Institutional Policy and Sustainability

This study suggests the implementation of MvT in EFL higher education environments, whether as an experimental or sustainable method, is controlled by institutional policy. Although instructors may show interest in immersive technologies and instructional designers can provide specialized assistance, enduring integration depends on institutional structures that align innovation with the overarching pedagogical objective. Experiences with educational technology adoption indicate that innovations implemented as isolated projects are unlikely to endure unless they are incorporated into institutional requirements, supported by policy, and promoted by school dedication (Parmaxi, 2023).

In this context, sustainability extends basic access to an immersive platform; it refers to the degree to which institutions can facilitate sustained educational application through reliable infrastructure, professional development, and evaluative frameworks that promote continuous enhancement. The findings suggest that MvT encounters obstacles to sustainability when execution is inconsistent, financial backing is irregular, and efficacy is unclear. These conditions result in inconsistent adoption, so reinforcing MvT as experimental rather than instructional.

Data shows that continuing to innovate requires a strong alignment between university policy, academic support frameworks, and instructor workload expectations (Biggs, 1996). Innovative practices are challenging to maintain when instructors are incentivized to explore new technology without adequate recognition, time, or pedagogical support. This analysis indicates that faculty members are both supportive and driven to maintain MvT integrate when institutional policies acknowledge the significance of immersive teaching methods, so ensuring they are valued, supported, and corresponded with teaching quality frameworks.

Additionally, institutional policy may encourage continuous sustainability by developing a systematic framework for professional development in immersive technologies. Rather of depending on scheduled workshops, educational institutions might integrate MvT-based training into current teaching and learning programs to ensure continuity. Parmaxi (2023) posited that the continued utilization of immersive environments in language acquisition is more probable with the availability of ongoing training and reflective practice for instructors. These policies aim to move immersive technology from experimental novelty to integral inclusion in instructional methods.

Ultimately, institutional attention to sustainability encompasses procedures for assessment and criticism. The findings suggest that instructors require opportunities to lead MvT-oriented activities and possess the capacity for iterative enhancements. Policies that encourage data-informed reflection, student feedback, peer review, and teaching innovation grants help cultivate a culture of continual improvement and prevent stagnation. In summary, these findings indicate that the integration of MvT should be sustainable through institutional policies which encourage pedagogical alignment, long-term support, and iterative enhancement rather than short-term experimentation.

Synthesis

This chapter explored the practical implications of the study's findings through three interconnected perspectives: teacher practice, instructional design and academic support, and institutional policy. Within these dimensions, we identify persistent elements: the MvT educational significance in EFL. ELL in higher education is influenced not by technology itself, but by the pedagogical, organizational, and institutional contexts of its implementation. The results support the literature review, which highlighted an absence in the application of

immersive technologies, typically employed in an exploratory or related capacity, characterized by a lack of strategic direction, disjointed concepts regarding their supportive potential, and limited incorporation into curriculum design and assessment. At the faculty practice level, it is demonstrated that pedagogical clarity, scaffolded involvement, and collaborative task design are essential for fostering immersive environments that facilitate communicative language learning instead of promoting novelty-driven engagement.

From an IDS perspective, these results emphasize the importance of professional development and pedagogical partnerships in supporting instructors in moving beyond trial and error in design. At the institutional level, sustainability is a policy matter that calls for long-term involvement and solid infrastructure, as well as the coherence of innovation initiatives with teaching needs.

These implications collectively suggest that the meaningful, sustainable integration of MvT in the EFL higher education environment requires coherence across instructional, support, and policy levels. By considering these interrelated elements, institutions may be better placed to empower teachers to use immersive technologies in a pedagogically informed manner, rather than on an ad hoc basis to simply add novelty to existing practice.

Guideline 1: Identify Appropriate MvT Tools

Guideline 1 recommends that instructors identify the appropriate MvT tool based on the students' level and coursework. Instructors who integrate MvT into their classrooms must first determine what level of MvT is most appropriate for the EFL student population they are teaching (Al-Shorman & Al-Shehri, 2021). Instructors should further consider the student's grade level, the specific coursework content, and the student's individual needs, including their learning styles and challenges (Sawant, 2021). Student success is often dependent upon the instructor's

application of such technology, as with an MvT tool. First, instructors need to assess the appropriate level of support for these students (Sheerah, 2022). This recommendation reflects the principle of differentiated instruction. The tools should be fitted to learner needs according to learner readiness, personal interests, and experience to ensure that the technology is supporting, rather than complicating, the learning process.

Guideline 2: Engage in Targeted MvT Training

Guideline 2 requires instructors to identify and engage in specific training for these processes within the programs. This includes learning how the role of MvT can enhance EFL learning and ELL skills (Bansal et al., 2022; Mitchell & McCarren, 2023). This includes ensuring that access and provisions are available for all EFL students. Furthermore, instructors should establish safety protocols for student access, teaching students about appropriate behavior and communication when using this technology (Talan & Kalinkara, 2022). The emphasis here connects with instructor self-efficacy theory, in that instructors who feel competent in both technical and pedagogical use of MvT are more likely to integrate it effectively and persist despite challenges. Therefore, the training should not only be technical but also confidence-building.

Guideline 3: Integrate MvT into the Curriculum

The third guideline emphasizes the need to utilize the MvT tool as support for EFL student learning by integrating it into the course. Instructors should be aware of how to effectively implement MvT tools in EFL education while learning best practices for utilizing them to enhance English skills (Brevik & Rindal, 2020; Islam et al., 2022). Recognize and implement integration with the existing curriculum by linking VR to other subject content and

schoolwork. Instructors should consider how MvT can support and enhance their students' learning.

The use of VR and ICT-guided tools for EFL student learning can also promote digital literacy, as instructors should model and practice effective digital practices in the classroom (Hossain, 2024). The constructivist learning theory supports this approach because when technology is used in authentic tasks across multiple topics or objectives, students can actively construct knowledge rather than passively receiving information.

Guideline 4: Adoption of MvT as an Interactive Method

The last recommendation would be to adopt MvT as an interactive learning method that involves EFL students in the teaching process. This study reports results that show increases in students' involvement and motivation (Biletska et al., 2021), and the suggested guidelines encourage instructors to integrate the tools with methods that have been shown to be effective. Some of these methods include gaming-based learning, virtual classroom simulation, and interactive online learning sessions, which are all approaches that can improve student focus and provide an enjoyable learning experience (Dzaiy & Abdullah, 2024; Jahnke et al., 2022).

This suggestion is consistent with engagement theory (Miliszewska & Horwood, 2006), which sees learning as a reciprocal and integrative experience. By immersing EFL students in interactive spaces, MvT enables students to learn by experience and through working together, what is sometimes called "learning by doing." This approach not only aids understanding but also increases motivation so that education becomes more meaningful and more efficient (Dzaiy & Abdullah, 2024; Jahnke et al., 2022).

Limitations and Recommendations for Future Research

Although the implications from this study are important for instructors, they are also important for pedagogues, researchers, and academic administrators. Some design and methodological shortcomings may temper the generalization of findings. One of the main drawbacks is that this review used an ILR method of data extraction, which depends upon interpretation or the researcher discretion in the examination of studies. Given that this approach is fundamentally qualitative, the results may reflect subjective assessments or miss more nuanced biases in the reviewed literature (Asad et al., 2021). While the researcher aimed to ensure appropriate rigor and fairness through a well-structured and uniform selection process, this review is unlikely to be free of interpretative bias.

Flexibility regarding the ILR design in the current study also made it possible to include a mixture of sources. However, it should be noted that other information could have influenced interpretations (Whittemore & Knafl, 2005). A further limitation is that a meta-analysis was not conducted; thus, the study could not statistically assess the quantitative effects of MvT or the interventions themselves on learning gains. Thus, although the results provide interesting insights, they need to be interpreted with caution and considered a starting point for future, more evidence-based studies.

However, the integrative approach in this research allowed for the incorporation of many study design types (such diverse types of studies to be included in view of the emergent and cross-disciplinary nature of MvT-related research in EFL and higher education settings). In contrast to systematic reviews or meta-analyses, which emphasize consistency and effect size quantification from similar experimental designs, an integrative review allows the incorporation of qualitative, quantitative, and mixed-method studies. This flexibility was particularly crucial as

the current literature base on MvT is fragmentary with studies ranging greatly in methodological quality, participant groups, contexts of instruction, and outcomes. Therefore, limiting the review to experimental designs alone would have eliminated a large body of relevant work and hindered attempts to understand larger pedagogical and institutional trends.

This methodological inclusiveness also implies limitations that should be recognized. A majority of the studies summarized used self-reported data, surveys, interviews, or small-scale pilot implementations. Although they are also useful in understanding perceptions, attitudes, and early-stage practices, these methods can only do so much to empirically predict and quantify learning processes, as they are limited in their ability to infer causality or to measure learning outcomes. With limited sample sizes and a brief amount of time for the intervention, the findings can be hard to generalize with factors that may not easily be replicated in other settings, (e.g., novelty effects, instructor enthusiasm, support from the educational organization), which are difficult to replicate in other situations.

These limitations emphasize the importance of future investigations making use of more elaborate and multi-strategic methods. Longitudinal research would be especially useful to ascertain whether continued exposure to immersive technologies has long-term effects on language acquisition, engagement in language programs, and practices beyond the short-term novelty effects. Additionally, by providing insight into the effectiveness of specific pedagogical approaches and facilitating comparison between instructional conditions, experimental and quasi-experimental designs provide further insight into the efficacy of particular pedagogical approaches within MvT environments.

Therefore, in order to connect measurable learning improvements with the experiential aspects of immersive learning, it has been shown that mixed-method designs providing

numerical outcome metrics alongside qualitative considerations can aid comprehension of the impact of immersive learning. Collectively, these approaches would cement the empirical rigor of the field and foster more robust judgments about the sustained educational importance of MvT.

Future research should continue to explore how MvT can be used to improve ELL outcomes for EFL students at HEIs. Studies that track progress over time could show whether short-term gains in motivation and engagement lead to long-term language growth. In addition, the future work could focus on how instructor training, institutional support, and student access affect the successful use of MvT across different settings.

Instructor training would incorporate new curricula that use new technology and creative methods such as AI and interactive computer programs. Resources, policies, personnel, and information technology may advance MvT and not be a limiting factor. This may include examination of new methods to improve reading, writing, speaking, and listening skills with MvT. Student access can improve with varying new technology, differentiating instruction practices, and ensuring that teaching of MvT tools meets diverse learner needs. Finally, there is some inconsistency as to what constitutes MvT. While many studies document the effects of technologies that have been around for decades, such as VR and AR, their precise role in MvT and higher education requires further consideration and study.

Conclusion

This chapter contains an analysis of the findings that were generated from Chapter 4. A summary of the problem and purpose of the study was provided, along with an overview of the findings associated with the research question and the two research objectives. The extent to which the findings aligned with previous research was also discussed, and the theoretical

implications of the findings were presented. Based on the evidence presented in this study, it is clear that MvT and its associated technologies can improve many skills required by EFL learners at HEIs.

The literature that was included in this review provided new insights regarding the variety of MvT content and designs. Some of the recommendations were centered on improving research designs and implementing more rigorously controlled interventions, as well as reviews, to create evidence-based guidance for ELL instructors and students. Nevertheless, MvT can help EFL students in higher education to achieve more effective ELL and offers advantages over many other technologies. Currently, EFL settings can and should utilize this paradigm, along with tools like AR and VR.

Further research should focus on developing adapted interventions that maximize the benefits of MvT for EFL learners with specific needs. In direct response to the central research question, namely "What evidence-based guidance can be provided to EFL instructors in higher education on using MvT to enhance ELL," this study concludes that MvT offers clear pedagogical value when implemented with attention to training, infrastructure, and integration into existing curricula.

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Appendix A

Result Tables

Citation	Theme	Method / Design	Summary Findings
Akram, H., Abdelrady, A. H., Al-Adwan, A. S., & Ramzan, M. (2022). Teachers' perceptions of technology integration in teaching-learning practices: A systematic review. *Frontiers in Psychology*, *13*.	Teaching (RQ2)	Qualitative / Systematic Analysis	Effective policies are needed to incorporate ICT to address limitations in ICT infrastructure, tools, software, internet, and labs.
Alfadil, M. (2020). Effectiveness of virtual reality game in foreign language vocabulary acquisition. *Computer s & Education*, *153.*	Technology (GRQ)	Quantitative/ Quasi-Experimental Design	A nonrandom convenience sample of (n = 64) male students was included in the experimental group and control group with (n = 32) students. The application of the VR game House of Languages improved student achievement in vocabulary acquisition, which poses a helpful technique for EFL.
Almusharraf, A., & Bailey, D. (2023). Machine translation in language acquisition: A study on EFL students' perceptions and practices in Saudi Arabia and South Korea. *Journal of Computer Assisted Learning*, *39*(6), 1988-2003.	Student (GRQ) (RQ2)	Mixed-Methods	Investigation of MvT tools within higher-education EFL students in Saudi Arabia and South Korea. A sample of Saudi (*n* = 310) and South Korean (*n* = 160) engaged in EFL learning. The findings showed the practical level of acceptance and utilization of MvT tools. English avoidance behavior, benefits, and foreign language proficiency were associated with increased actual use of MvT tools (e.g., Google Translate). The application of these tools

Citation	Theme	Method / Design	Summary Findings
			may support EFL language acquisition.
AlNajdi, S. M. (2022). The effectiveness of using augmented reality (AR) to enhance student performance: Using quick response (QR) codes in student textbooks in the Saudi education system. *Educational Technology Research and Development*, *70*(3), 1105-1124.	Technology (GRQ)	Qualitative/ Descriptive	Examined the application of Augmented reality (AR) in The Saudi Ministry of Education to support education, using AR experiments, e-textbooks, learning games, video clips, and TV channels. Results showed that technology integration is only as effective as the infrastructure, support, and student interest.
Al-Ansi, A. M., Jaboob, M., Garad, A., & Al-Ansi, A. (2023). Analyzing augmented reality (AR) and virtual reality (VR) recent developments in education. *Social Sciences & Humanities Open*, *8*(1).	Technology (GRQ)	Qualitative/Comprehensive Review	AR and VR technology were examined by exploring a total of 1536 articles that were selected for further analysis. According to the researchers, a further need exists to explore applications effectively for language learners.
Alpala, L. O., Quiroga-Parra, D. J., Torres, J. C., & Peluffo-Ordóñez, D. H. (2022). Smart factory using virtual reality and online multi-user: Towards a metaverse for experimental frameworks. *Applied Sciences*, *12*(12), 6258.	Technology (GRQ)	Qualitative / Descriptive Review	The researchers assessed VR application specifically within the considerations of an experimental framework for implementation of MvT procedures to support educational processes. According to Alpala et al. (2022), MvT holds potential applicability for education and language acquisition.

Citation	Theme	Method / Design	Summary Findings
Apriani, E., Asha, L., Botifar, M., Arcanita, R., Hidayah, J., Syafri, F., & Supardan, D. (2024). ICT in Metaverse Learning at Islamic Universities in Indonesia: Students' Writing Metacognitive. In *Impact and Potential of Machine Learning in the Metaverse* (pp. 213-245). IGI Global.	Student (RQ1)	Quantitative Survey	Apriani et al. (2024) assessed student writing, specifically knowledge, strategies, and awareness, among a group of 30 English students in Islamic universities. Researchers demonstrated that (1) Metacognitive knowledge was classified in the moderate category with 57% mean of students;(2) Metacognitive strategies have a mean score of 83, 69%, which means at a high level;(3) Metacognitive awareness showed that the high levels (75.00%–86.50%). Metacognitive awareness in writing skills was positively impacted by using ICT in metaverse learning.
Asad, M. M., Naz, A., Churi, P., & Tahanzadeh, M. M. (2021). Virtual reality as a pedagogical tool to enhance experiential learning: A systematic literature review. *Education Research International*, *2021*(1) , 7061623.	Student (RQ1)	Qualitative / Systematic	Asad et al. (2021) reviewed technology implementation, specifically VR, to understand student learning and experimental learning. According to Asad et al. (2021), nine themes were identified: a) virtual reality as pedagogical tool, (b) virtual reality as emerging educational technology tool, (c) virtual reality as digital transformation, (d) virtual reality as teaching-learning model, (e) virtual reality as architectural pedagogy, (f) virtual reality for communication skills, (g) virtual reality for reading and writing skills, (h) virtual reality for social learning, and (i) virtual reality for experiential learning.

Citation	Theme	Method / Design	Summary Findings
Biletska, I. O., Paladieva, A. F., Avchinnikova, H. D., & Kazak, Y. Y. (2021). The use of modern technologies by foreign language teachers: Developing digital skills. *Linguistics and Culture Review*, 16-27.	Instructor (RQ2)	Qualitative / Descriptive	Biletska et al. (2021) reviewed the implementation of ICT technologies for teaching EFL, specifically via exploring a systematic descriptive review to understand training, the future, and evidence-based practices for using technology for educators. According to Biletska et al. (2021), students' task completion, when guided by educators, can improve via the use of ICT.
Bin-Hady, W. R. A., & Al-Tamimi, N. O. M. (2021). The use of technology in informal English language learning: Evidence from Yemeni undergraduate students. *Learning and Teaching in Higher Education: Gulf Perspectives*, *17*(2), 107-120.	Student (RQ1)	Mixed Methods	Bin-Hady & Al-Tamimi (2021) conducted a mixed methods approach amongst 110 undergraduate students enrolled in English Departments across Yemen. The findings showed that students' use of technology-based strategies in informal settings encouraged listening, speaking, and reading skills while supporting vocabulary was enhanced over grammar and pronunciation.
Y. C. Chen (2024). Effects of technology-enhanced language learning on reducing EFL learners' public speaking anxiety. Computer Assisted Language Learning, 37(4), 789-813.	Student (RQ1)	Mixed Methods	C. Chen (2024) examined EFL student learning using VR and AI technology. The sample of 33 students engaged in either lecture-based, mobile-assisted, or VR-facilitated instruction for four weeks. The findings showed that group comparisons were not statistically different in oral performance. However, technology-enabled methods improved performance in speaking and reduced anxiety.

Citation	Theme	Method / Design	Summary Findings
Fan, M., Antle, A. N., & Warren, J. L. (2020). Augmented reality for early language learning: A systematic review of augmented reality application design, instructional strategies, and evaluation outcomes. *Journal of Educational Computing Research*, *58*(6), 1059-1100.	Instructor (RQ2)	Qualitative Systematic Literature Review	Fan et al. (2020) considered language learning by examining 53 papers across a span of nine years. The findings showed five design strategies: three-dimensional multimedia content, hands-on interaction with physical learning materials, gamification, spatial mappings, and location-based features. Employing these strategies can support student learning via educators' use of three-dimensional multimedia with advanced organizers (presentation strategy) and/or using location-based content with learners' self-exploration (discovery strategy), and motivation was enhanced by using game mechanisms with discovery strategy.
Feng, B., & Ng, L. L. (2023). Facilitating writing performance of EFL learners via virtual reality: Immersion, presence, embodiment. Frontiers in Psychology, 14, 1134242.	Student (RQ1)	Mixed Method	Feng and Ng (2023) investigated immersive virtual reality (IVR) by examining 144 Chinese-speaking English learners, who were divided into an experimental group ($N = 69$) and a control group ($N = 75$), who experienced the treatments related to the writing tasks. The findings showed improved target word usage, lexical density, distribution richness, and completion of tasks than those in the conventional classroom.
Hazaymeh, W. A. (2021). EFL Students' perceptions of Online distance learning for enhancing English language learning during COVID-19	Student (RQ1)	Quantitative Descriptive	Hazaymeh (2021) investigated 60 undergraduate students' exposure to and perception of ELL learning using online modules and tools, specifically during COVID-19. The findings showed that the majority of

Citation	Theme	Method / Design	Summary Findings
Pandemic. *Internation al Journal of Instruction*, *14*(3), 501-518.			respondents (86.66%) acquired language proficiency successfully through online distance learning, which indicated a flexible and suitable learning environment. Drawbacks included technical problems and the lack of physical interactions.
Huang, X., Zou, D., Cheng, G., & Xie, H. (2021). A systematic review of AR and VR enhanced language learning. *Sustainabilit y*, *13*(9), 4639.	Instructor (RQ2)	Qualitative Systematic Review	Huang et al. (2021) evaluated AR and VR in ELL via a sample of 88 articles exploring the implementation from educator and student perspectives. Key themes indicated: (1) immersing learners into virtual worlds is the foremost approach to language learning in AR and VR studies;(2) university students were the main users of AR/VR technologies;(3) the significant research findings concerning the benefits of AR and VR included improvement of students' learning outcomes, enhancement of motivation, and positive perceptions towards using AR and VR;(4) AR and VR tools promoted language learning through providing immersive learning experience, enhancing motivation, creating interaction, and reducing learning anxiety; and (5) implications identified from previous research include the need of providing training for teachers, enlarging sample sizes, and exploring learner factors such as learner engagement and satisfaction.
Kim, H. S., Kim, N. Y., & Cha, Y. (2023). Exploring the	Students (RQ1)	Quantitative Experimental	Kim et al. (2023) examined MvT learning for EFL learning among forty-five students who

Citation	Theme	Method / Design	Summary Findings
potential of metaverse as a future learning platform for enhancing EFL learners' English proficiency. *23*, 220-236.			were divided into two groups: traditional and Metaverse. No significant differences were found between the two groups. Students reflected on the advantages and disadvantages of Metaverse learning, including infrastructural and technological barriers.
Lee, H., & Hwang, Y. (2022). Technology-enhanced education through VR-making and metaverse-linking to foster teacher readiness and sustainable learning. *Sustainability*, *14*(8), 4786.	Instructor (RQ2)	Qualitative Review	Lee and Hwang (2022) examined the implementation of VR and the use of MvT-based approaches to improve student learning outcomes. The findings showed that suitability is based on teacher preparedness, while pre-service training can improve pedagogical benefits.
Lee, S. M. (2023). Second language learning through an emergent narrative in a narrative-rich customizable metaverse platform. *IEEE Transactions on Learning Technologies*, *16*(6), 1071-1081.	Student (RQ1)	Mixed Methods	Lee (2023) examined EFL learning via the use of MvT support. A sample of 72 Korean participants who were engaged in MvT learning processes. The findings showed that students enjoyed MvT learning, and technology improved their interactions and engagement.
Parmaxi, A. (2023). Virtual reality in language learning: A systematic review and implications for research and practice. *Interactive learning environments*, *31*(1), 172-184.	Instructor (RQ2)	Qualitative Systematic Review	Parmaxi (2023) investigated VR for language learning, exploring a sample of 17 studies via a systematic review. The findings indicated key themes regarding settings and duration of educational activities; (b) benefits and limitations of using VR as an educational tool in the language classroom; and (c) future research directions

Citation	Theme	Method / Design	Summary Findings
			regarding the educational use of VR based on the reviewed literature.
Pinto, R. D., Peixoto, B., Melo, M., Cabral, L., & Bessa, M. (2021). Foreign language learning gamification using virtual reality—A systematic review of empirical research. *Education Sciences*, *11*(5), 222.	Instructor (RQ2)	Qualitative Systematic Review	Pinto et al. (2021) explored technology implementation for language learning using a systematic review approach. The review of articles demonstrated that gamification inherent to VR can support learning for a second/foreign language. However, a lack of educator perspectives limits understanding of technical implementation for pedagogical purposes.
Seyyedrezaei, M. S., Amiryousefi, M., Gimeno-Sanz, A., & Tavakoli, M. (2024). A meta-analysis of the relative effectiveness of technology-enhanced language learning on ESL/EFL writing performance: Retrospect and prospect. *Computer Assisted Language Learning*, *37*(7), 1771-1805.	Technology (GRQ)	Quantitative Meta-Analysis	Seyyedrezaei et al. (2024) conducted a meta-analysis of technology for EFL learning and performance. The meta-analysis results showed the following themes: a significant relationship between the type of technology, the genre of writing, and the overall effect size of the applications of educational technology
Wang, M., Yu, H., Bell, Z., & Chu, X. (2022). Constructing an edu-metaverse ecosystem: A new and innovative framework. *IEEE Transactions on Learning Technologies*, *15*(6), 685-696.	Instructor (RQ2)	Qualitative Systematic Review	Wang et al. (2022) reviewed MvT for learning purposes using a meta-analysis. The findings indicated the following themes: 1) instructional design and performance technology hub; 2) knowledge hub; 3) research and technology hub; and 4) talent and training hub. Common to all four hubs are the factors in the three wheels: 1) infrastructure, business industry, and

Citation	Theme	Method / Design	Summary Findings
			communication; 2) technology access and equity; and 3) user rights, data security, and privacy policy.
Wu, J. G., Zhang, D., & Lee, S. M. (2023). Into the brave new metaverse: Envisaging future language teaching and learning. *IEEE Transactions on Learning Technologies*, *17*, 44-53.	Instructor (RQ2)	Qualitative Meta-Review	Wu et al. (2023) examined the implementation of MvT for the purpose of EFL learning acquisition. The meta-analysis identified key themes regarding language education, such as pedagogical design, technical support, and psychological endorsement in the Metaverse. To predict the future pathways of language education. The findings indicated that a need exists to support educational stakeholders.

Appendix B

Recommendations for Implementing MvT in EFL Higher Education

Guideline	Description	Supporting Theories	Key References
1. Identify the appropriate MvT tool based on grade and coursework	Instructors should select tools (e.g., VR, AR, immersive platforms) aligned with the students' level, subject matter, and learning needs. Careful matching ensures relevance and maximizes learning outcomes.	• Technology Acceptance Model (TAM), perceived usefulness and ease of use influence adoption; Constructivism, tools must fit learners' developmental stage.	Al-Shorman & Al-Shehri (2021); Sawant (2021); Sheerah (2022)
2. Provide specific training for instructors	Instructors should receive structured training in using MvT, including technical proficiency, pedagogical integration, and student safety protocols.	• Zone of Proximal Development (ZPD), scaffolding supports both instructor and learner growth.	Bansal et al. (2022); Mitchell & McCarren (2023); Talan &

Guideline	Description	Supporting Theories	Key References
		• Diffusion of Innovations, training reduces barriers to adoption.	Kalinkara (2022)
3. Integrate MvT into the curriculum	MvT should not be an "add-on" but embedded within existing courses to reinforce language learning objectives (e.g., vocabulary, writing, communication skills).	• Social Learning Theory, interaction and modeling foster skill development. • Constructivism Theory, integration supports experiential learning.	Brevik & Rindal (2020) ; Islam et al. (2022); Hossain (2024)
4. Use MvT to foster student engagement	MvT can increase motivation and interaction through gamification, simulations, and immersive environments that reduce anxiety and enhance collaboration.	• Engagement Theory, meaningful tasks drive participation. • Sociocultural Theory, collaboration and mediated learning promote language acquisition.	Biletska et al. (2021); Dzaiy & Abdullah (2024); Jahnke et al. (2022)