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Muhammad Mujtaba Asad

Aisha Naz Ansari

Prathamesh Churi

Mohammad Mehdi Tahanzadeh

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Review Article

Virtual Reality as Pedagogical Tool to Enhance Experiential Learning: A Systematic Literature Review

Muhammad Mujtaba Asad,[1] **Aisha Naz**,[1] **Prathamesh Churi**,[2] **and Mohammad Mehdi Tahanzadeh**[3]

[1]*Sukkur IBA University, Airport Road, Sukkur, Pakistan*
[2]*Computer Engineering Department, MPSTME, Narsee Monjee Institute of Management Studies University, Mumbai, India*
[3]*Department of English, Faculty of Humanities, Islamic Azad University, Ahvaz Branch, Ahvaz, Iran*

Correspondence should be addressed to Mohammad Mehdi Tahanzadeh; mthanantahan@gmail.com

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Since half of the century, technology has dominated the modern era. The rapid advancement of technology has reached generating artificial intelligence and artificial realities. So, virtual reality is an emerging technology and is applicable in education as well. Virtual reality is a computer-generated simulation, where people can interact within an artificial environment. Moreover, in an educational setting, such an environment provides students with a chance to get experiential learning. This paper has a systematic literature review on emerging technologies, such as virtual reality as a pedagogical tool for enhancing students' experiential learning. This review aims to explore and understand the effect of virtual reality on students' experiential learning by reviewing twenty-six selected articles. The selected studies have followed various methodologies and are from different contexts. This review study aims to present a systematic literature review for understanding and exploring the effect of virtual reality as a pedagogical tool for enhancing students' experiential learning. Nine themes were identified, which are (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. Thus, it is found that virtual reality is used as a pedagogical tool for various subject areas for encouraging involvement. It is helpful in medical, engineering, language, and social learning, as it provides a chance to get first-hand experience of the environment. Also, it helps learners to engage in a presented virtual environment and experience the sense of presence in it and enhances students' experiential learning. Therefore, this review found virtual reality as an essential pedagogical tool for strengthening students' experiential learning.

1. Introduction

This review study aims to present the literature review about virtual reality as a pedagogical tool for enhancing students' experiential learning. This study has intended to cover the brief description of the concept of virtual reality in general and specifically virtual reality as a tool of pedagogy which is one of the applications of virtual reality. This paper has presented a review of twenty-six research papers on virtual reality. The term virtual is used frequently in today's world, which directs the listener's attention towards technology or computer-based program. Virtual refers to imaginative sort of objects and activities which are not performed or observed on physical grounds. However, this term of virtual reality was initially introduced in the 1980s to declare the power of technology to develop an artificial world. Nevertheless, people's attention in recent times goes directly towards cyberspace after listening to the term virtual reality. This association of virtuality to technology has taken time, and the field is now known to most people worldwide.

In educational settings, school level students do not get enough access to computers and the Internet. Furthermore, if some students access computers and technology, they could not get proper teacher support to learn technological skills. Thus, while reaching to university level, their technological skills are found to be poor. After becoming part of a university, those same students get access to proper teacher support and tasks to be completed on computers. Still, advanced technologies are not used commonly. However, the application of virtual reality helps enhance experiential learning among students. Also, helping students experience the world virtually is an effective and efficient way to practice in educational settings.

The school setting does not support even essential technological integration. However, higher education institutions are continuously trying to bring innovation in the teaching-learning process and technological advancement in education settings; additionally, some institutions also offer virtual learning environments for their students. Nevertheless, the implementation of virtual reality is rarely observed. Although students learn about virtual reality and its applications, they could not get a chance to experience it in most cases. However, some get the experience of the virtual environment. This systematic literature review purports to provide insights about virtual reality and its usability for enhancing experiential learning. With the help of this systematic literature review, empirical findings will be presented to reveal the practicality and usability of virtuality in an educational context. Also, some pedagogical dimensions of virtual reality will be presented to help educators in implementing it.

Moreover, the enhancement of experiences and experiential learning among students can be promoted if teachers learn the pedagogical dimension. Thus, this study aims to present a systematic review of studies to provide an insight about experiential learning to be enhanced by practicing virtual reality as a pedagogical tool. This review of empirical studies will help in understanding the effects of virtual reality. This is one of the unique literature reviews of its nature, highlighting the significant gaps in knowledge, methodology, and implementation challenges educators face to integrate the virtual reality (VR) approach for the teaching and learning process.

2. Methodology

2.1. Process of Study and Literature Search. Peer-reviewed journal papers that met all of the inclusion requirements were part of a presented systematic review. An initial scoping analysis established seven databases, related keywords, and search terms that could be integrated into a systematic literature review. For literature searching, the simple process of using keywords was used. As the study entitles virtual reality as a pedagogical tool for enhancing experiential learning, searching terms and keywords such as virtual reality, virtual reality as a pedagogical tool, experiential learning, and virtual reality for experiential learning were searched from Google, Google Scholar, Sage, Emerald, Elsevier, Eric, and Taylor and Francis databases. Through this search, almost 67 articles were found, out of which 26 most relevant articles were selected for this review.

Table 1: Themes.

S. no.	Themes
1	Virtual reality as pedagogical tool
2	Virtual reality as emerging educational technology tool
3	Virtual reality as digital transformation
4	Virtual reality as teaching-learning model
5	Virtual reality as architectural pedagogy
6	Virtual reality for communication skills
7	Virtual reality for reading and writing skills
8	Virtual reality for social learning
9	Virtual reality for experiential learning

2.2. Selection Process and Inclusion Criteria. After the search results, there were 67 articles, and the chosen articles were 26. Those 26 articles were chosen based on the relevant themes of virtual reality as a pedagogical tool and virtual reality for enhancing experiential learning. Also, based on the year of study from 2009 to 2020, the articles from famous and authentic publishers were selected, but conference papers, thesis, and reports were not included. Then, those articles were sorted based on the topic and relevant themes (Table 1).

2.3. TPACK: Instructional Model. Content knowledge (CK), pedagogy knowledge (PK), and technology knowledge (TK) all play a role in the TPACK model [1]. Students' knowledge of the subject area (CK) and understanding of particular mindsets and behaving using virtual reality tools and services (TK) must be combined with instructional comprehension of how and why learning occurs, what they learn, and how they could use this to accomplish high-quality learning in a virtual reality context. The TPACK Conceptual Developed Model in Virtual Reality technology incorporates analytical thought into education by defining the fundamental principles of teaching, material, and technologies, as well as their variations, within such a structured, multilayered, and multifactorial paradigm that stresses why and how rather than what [2]. Awareness over what makes it complex or easily understood, how technical capabilities can allow educators to overcome any of the challenges students encounter, and how virtual reality can create new paradigms or improve existing ones [1]. The development of exposure to the complex, two-way communication process between all these constituents of information positioned in unique contexts is required for the effective implementation of the TPACK model.

2.4. Virtual Reality and Experiential Learning

2.4.1. Virtual Reality. The term virtual reality came up in the United States by Jaron Lanier in 1980. This term virtual reality refers to a virtual representation of reality. It is an artificially generated representation of a 3D environment and reality that may then be dealt with in a relatively natural

way by a human wearing particular computer components such as a headset with a display within and gloves with sensors. This means that something can be evident in life and practically be programmed to happen, but only digitally. Virtual reality is described as actual participation in a simulated universe [3], a common but limited concept. For this, Jones and Warren [4] stated that digital reality learning experiences have been integrated with visual, auditory, and immersive stimuli to provide powerful environments for deepening student interaction and meeting the emotional requirements of the 21st-century generation of learners.

2.4.2. Experiential Learning. The theory of experiential learning is mainly based on the work of various educational scholars such as Dewey, Lewin, and Piaget, who put the experiences at the forefront during learning [5]. They in another study also highlighted that experiential learning theory describes learning as the mechanism by which understanding is generated by the process whereby experiences are modified for constructing meanings [6]. By repeating four phases of the experiential learning cycle, direct experience, thinking for reflective assessment, making inferences, and constructive discovery, learners develop profound comprehension and knowledge [5]. Concepts gained from direct experience or making inferences can be converted into understanding through critical reflection or productive exploration [7, 8].

2.5. Virtual Reality as Pedagogical Tool. Empirical studies were analyzed to explore how virtual reality functions in the teaching-learning process, as a pedagogical tool. Virtual reality is a computer-assisted program that presents a virtual environment. However, it was not developed to be used as a pedagogical tool, i.e., to support, lead, or facilitate the teaching and learning process. In 1966, the first-ever documented use of a computer-assisted virtual environment when the United States Air Force developed a flight simulator was for training purposes [9]. During that time, virtual reality was used in other fields, but it was failed in almost all market-led departments [10]. Despite its systemic failure, several reviews of virtual reality's use in education have found promising results, including improved time on task, satisfaction, inspiration, comprehensible input, and long-term commitment [11–14].

However, virtual reality allows people to participate in actual simulations and virtual explorations, which would then be impossible or risky to do in real life [15, 16]. For instance, any educational institution that teaches history and geography is unlikely to arrange regular travel or field trips as a feasible choice for their learners. Nevertheless, through virtual reality, all these students may discover the monumental elegance of the shrines or even merely fictional buildings without really departing their school [17]. Additionally, virtual reality is applied to replicate medical procedures, which is particularly evident everywhere. Though this mainly involves using virtual reality to replicate surgical procedures, it may also stimulate other medical procedures, including recovery [18]. Nolen et al. [19] built digital teaching-learning simulations to aid in the recovery of children with ADHD. Furthermore, Chang et al. [20] looked at the ability of virtual reality to inspire patients with severe health problems.

Moreover, for distance learning, learners' geographic location is meaningless since all of the applications studied were intended to mimic real-world learning environments. Students can access the course materials and services of leading institutions worldwide by distance learning, and several surveys have shown that virtual reality enables students to enjoy the process of learning even in distance learning programs [21]. Students are expected to operate essential resources on institutions [22]. Virtual reality is merely a tool for delivering distance learning, but it promotes all of its various benefits. Students who use distance learning want learning experiences comparable to those offered in traditional settings [23]. The academicians' conviction often inspires virtual reality strategies to enable more profitable learning opportunities than those offered by conventional teaching approaches [18]. Though it is helpful in educational situations, some issues are also raised by students, a lack of realism. Some authors thought that the lack of authenticity offered by instructional virtual reality applications could distract learners from experiencing learning [24]. Moreover, educators tended to use virtual reality strategies only in specialized scenarios involving practical simulations or professional training [13, 25]. Also, a small percentage of the research studies are genuinely based on pedagogic rationale [25].

Merchant et al. [26] has examined three different types of virtual reality: games, simulations, and virtual worlds. Immersion allows an actor to walk freely across the simulated universe, exploring ideas, meeting goals, and eliciting inspiration and understanding [27]. Those immersions aim to replicate a real-world scenario that may aid learning by enabling the test of variables and their effects. Also, digital environments offer users an interactive and nonimmersive sense of presence in a 3D virtual environment and the ability to control, communicate with, and create objects. Additionally, Dickey [28] has highlighted that a virtual environment can allow participants to communicate with one another inside a virtual environment.

Experimental studies found that simulative and immersive devices can be the perfect way of promoting cognitive learning experiences, which can require a high stake of visualization and awareness of experiences. Also, medical learning practical by nuanced 3D visualizations of the human body and animal body was more conducive to learning in immersive virtual reality [29]. Similarly, Lamb et al. [30] found that the simulation and interaction of DNA strands in a simulated world provided more incredible learning results than a lecture or a traditional instruction. One potential reason for technological usefulness was greater focus and interaction with the immersive virtual reality environment. Even though immersive virtual reality has been proven to support natural science learning, there is also evidence that not all learning outcomes can also be learned. When it came to recalling questions, the researchers discovered that immersive virtual reality outperformed

video or textbook instruction, but not when interpreting the content [31].

The study of Hamilton et al. [32] revealed that there is a relatively homogeneous implementation of immersive virtual reality for both the subject areas represented and the domain of learning being taught. Nearly 70% of the experiments are found to be in the natural sciences or engineering areas, with other topics being slightly presented only. However, it is worth noting that medical sciences make up a less engagement of virtual reality. This was because most virtual reality medical technologies have surgical simulators, which were not encountered in the experiment. Most experiments used simulative virtual reality to teach thinking abilities, with just a few looking at procedural or affective uses.

This review inferred that virtual reality is found to be helpful as a pedagogical tool in education and the experimental nature of teaching and learning. It discovered that the use of interactive virtual reality is generally limited to a few practical subject areas. Though in reviewed experimental studies, virtual reality interventions were usually brief and discrete, with no supplementary material provided. Despite this, several researchers found that using immersive virtual reality has a clear benefit over less immersive learning approaches. This was especially true when the subject matter was abstract or logical or emphasized procedural skills or tasks. While game-based virtual reality provides the best learning results, immersion and virtual worlds are also successful in raising learning attainment.

2.6. Virtual Reality as Emerging Educational Technology Tool. Under this theme, various studies were analyzed for understanding virtual reality as an emerging educational technology tool. When emerging devices become more widely used, educational professionals and scholars worldwide are interested in the effects of their vast range of applications for educational purposes. Digital reality learning experiences have been blended with visual, auditory, and immersive stimuli to provide influential venues for deepening student interaction and meeting the digital and 21st-century generation of learners [4].

A review of the book by Choi et al. [33] has found that virtual reality's pedagogical promise has been shown in various fields, including all types of engineering, medical sciences, multicultural education, mathematics, and computer studies as well as information technology to name a few. Interaction of avatar inside a 3D graphical world can now be feasible due to technological advancements, as shown by Second Life, a science and interactive simulation platform. It also added that considering the ways virtual reality-based learning is blurring the boundaries between disciplines and providing unambiguous access to knowledge that may be successfully useful for real-world situations, the promise of virtual reality-based learning can be seen. However, improved engagement and retention of learning experiences among students, high levels of interaction and teamwork for social development, the encouragement of constructive and learning experiences, and diversified exposure to practical knowledge to cope with real-world demands are only a few of the significant advantages for student learning in the virtual reality landscape.

Furthermore, it states that if robust virtual reality-based learning is applied, pedagogical benefits are manifested in advancing students' problem-solving and critical and rational thinking skills in a shared environment. Teachers' professional growth is addressed along with the improvement of technology infusion competence and self-efficacy, aiming for overcoming obstacles and grasping rewards in incorporating virtual reality innovations into the teaching and learning program [33]. Also, the encountered limitation is the absence of persuasive scientific evidence that a virtual reality experience improves motivation and learning under certain circumstances.

Additionally, another reviewed study was conducted by Elmgaddem [34]. This study found that several technical and economic advancements have made it possible to use virtual reality comfortably enough to pick everyone's curiosity. On the one side, computers and smartphones are more accessible and more substantial. The generalization of network connectivity and the speed of communications, either fixed or mobile, do not overlook the variety and diversity of information shared in virtual reality. Simultaneously, image or video quality has vastly increased. However, the ability to manipulate the objects of the synthetic universe using controls, such as the Oculus Touch, is significant progress in virtual reality. This encourages students, for instance, to exercise and learn more engagingly by communicating with things in the virtual world. Moreover, virtual reality's importance of teaching and learning stems in part from the ability to enhance and promote learning, enhance memory capability, and make smarter choices when functioning in an enjoyable and relaxing environment [34].

The review for this theme concludes that the development of virtual reality and its latest updates as a result of numerous technical developments now allows for an emerging form of learning which best suits the demands and requirements of the digital and 21st-century learners who desire entertainment, collaboration, interaction, and object manipulation. The learning process is triggered by the educational approach contained in virtual reality representation, whether learning happens due to experiencing some virtual reality learning contexts. Thus, the current generation of educators and scholars is responsible for bridging the digital divide and preparing the skills and competencies among digital learners required to succeed in this digitally globalized world. However, once specific technological and societal problems are addressed and education systems are better tailored to take full advantage of the promise of these innovations, a successful adaptation of virtual reality in education and learning would possibly occur.

2.7. Virtual Reality as Digital Transformation. The term "digital transformation" refers to a progressive rethinking of the use of advanced technologies and the ways to use technology to bring about progress in people's lives and processes. Technology has changed from simple computers

to computer-generated virtual environments which are immersive. The way digital transformation is observed, institutions must discuss the tools they employ to distribute and ingest information in order to maximize data obtained by digitalization. However, in a linked digital world, external tools such as augmented reality and virtual reality are needed to meet the unique needs of all positions, including those outside the workplace. For programmers, managers, and technicians, augmented and virtual reality technologies have new capabilities that meet all of these needs.

While virtual reality may not be suitable for use in the field, factory, or production line, it can be a great valuable training tool for the managers, technicians, and engineers who work in those settings. With contextualized, real-time data overlaid, virtual reality will provide a highly realistic simulated training environment. This allows controllers, repair technicians, and plant engineers to test a wide range of plant and field situations in a stable, offline setting, reducing the number of unknowns in the real-world environment. Virtual reality allows for almost unlimited simulation environments to be created at no chance of activities being interrupted. Virtual reality offers a visual, low-stress learning experience for these employees to master these skills. Digital platforms not only encourage users to access a learning environment at their leisure but also can provide various one-on-one educational opportunities tailored to the customer that would otherwise be cost-prohibitive [35].

For this theme, a review of a study conducted by Bailenson et al. [36] highlights that, in comparison to no transformations in the same context, using digital transformations of teachers and learners in a collaborative virtual environment will improve learning. So, this study has provided three different points of view regarding virtual reality for digital transformation. The first states that when teachers get real-time visual updates on the students they have been missing, they can better extend their gaze across them. The second states that changing the simulated classroom's spatial layout affects how well students study. Sitting in the central position of the teacher's line of sight ensures more learning than sitting on the sides, while being at the front yields more learning than sitting in the back. This layout shows students' ownership and involvement, which has a direct relation with learning. Hence, virtual reality encourages students' involvement which can enhance their learning. The final one states that differential learning occurs as simulated learners' social behaviours are changed. They are filling up the space of other students resulted in the learning of course resources only due to getting access to it and the minor learning of noncourse-related information compared to other colearner transitions. Thus, colearners need to have equal and direct access to a virtual environment, which may help them get a similar learning experience. To summarize, the current study's functional consequences are virtual transitions via multimedia will improve students' learning in certain situations.

Additionally, the review of another study conducted by Slater and Sanchez-Vives in 2016 found that there are so many considerations for justifying the idea of why virtual reality is an excellent educational platform. The first one is that it can transform abstract or imaginary thoughts into reality. This has the potential to be particularly effective in the teaching of mathematics [37]. Hwang and Hu [38] posit that, as opposed to conventional paper and pencil instruction, using a shared virtual world benefits students learning geometrical concepts. However, according to Kaulmann et al. [39], a virtual reality device built on a head-mounted display offers a learning experience for spatial visualization, particularly abstract mathematics concepts. The second one is that, despite the findings of the simulated playground trial, one of the reasons for using virtual reality in education is that it encourages "doing" rather than merely "observing," such as surgical training related to any part of the human body is offered in medical programs, which help students perform surgeries in a virtual environment rather than merely looking at those steps [40]. The third reason is that it may be used to supplement beneficial practices but impractical in action, even if they are possible in practice. For example, visiting a natural park outside of your country is impossible; however, simulated trips are very much possible [41]. The final reason could be that it was breaching reality's boundaries as a part of the discovery process. For example, imagine how different things like balancing would have been if gravity changed slightly or how interesting it would be to travel on a beam of light in a world where the speed of light differed. Dede et al. [42] have studied and tested these concepts for virtual reality. Thus, it suggests that the true strength of virtual reality is that it allows for techniques that go beyond reality in profound ways, rather than only investigating weird mechanics. Bailenson et al. [36], who were concerned with the delivery of instruction instead of the content, provided an overview of the virtual reality field of education. Also, it is essential to implement the virtual classroom in a collaborative digital world so that every student focuses on the teacher's attention. However, digital teammates, who can be either model students or distracting students, can also affect learning, and it showed that these interventions enhance academic performance. Bailenson and Beall [43] introduced the term transformed social contact to describe this kind of approach.

The review of this theme infers that technology is transformed and has rapidly advanced to create virtual worlds. Also, this advancement has opened doors of integration for it in different fields, and education is one of that fields. Virtual reality has enabled teachers and students to get immersive first-hand experience of abstract and virtual worlds and interact with them in education. Thus, it has enhanced students' academic performance by providing rich contextual and need-based exposure to the real-world virtually [36, 44].

2.8. Virtual Reality as Teaching-Learning Model. Under this theme, various studies were examined to understand virtual reality as a model for teaching and learning. The review of the study of Fowler [45] found that the use of virtual reality technology to create teaching practices has much potential, but it also has many drawbacks. Understanding the pedagogical underpinnings that can guide the creation and usage

of these virtual reality environments is also one of those obstacles. A few of the studies had a specific theoretical-pedagogical model to guide virtual environment usage and design. A philosophical paradigm is presented; it is almost invariably based on constructivism or a variation of the approach, such as problem-based learning, experiential learning, or interactive learning. At the same time, most of the studies do not mention their theory or philosophy of virtual reality-based learning [46].

A model of learning in 3D virtual environments was presented in 2010 by Dalgarno and Lee. This is based on three primary characteristics of the 3D virtual environment: smooth temporal, physical transition, and a high degree of interactivity. In terms of instruction, Dalgarno and Lee contend that 3D virtual learning environments have two distinct features: "representational accuracy" and "learner engagement." The accuracy of the image is referred to as representational fidelity, with high-fidelity displays being the most authentic. Learner contact in a 3D virtual learning environment, on the other hand, is a more complex term that describes the complexity of various experiences arising primarily from the user's degree of manifestation. The use of an avatar provides users with a reflection in a 3D virtual learning environment. The avatar is just a portrayal of the user, capable of communicating, expressing feelings, and controlling and creating objects as if the user was physically available in the 3D virtual learning environment. The two distinct features of representational accuracy and learner engagement combine to provide a subjective phenomenon known as "being there" or "sense of availability." The concern is whether or not these user interactions lead to any learning benefits. Dalgarno and Lee [47] examined virtual learning environment examples to define five main task affordances (i.e., operational characteristics) that can aid learning, which is (a) spatial information representation, (b) experiential learning, (c) interaction, (d) situational learning, and (e) collaborative learning.

However, a structure that is derived from technical affordances and incorporates pedagogical criteria is necessary to characterize the learning environment fully. These specifications can also guide the learning experience's structure. The idea of "immersion" is one concept that may help close the gap between pedagogy and technology. As a result, immersion offers a concept that can link the technical, psychological, and pedagogical aspects in a 3D virtual learning environment. Mayes and Fowler's [48] framework provides a principled means of connecting a term like immersion to the various means of interpreting an educational process. In the expanded model, Mayes and Fowler's system specifies the pedagogical or learning criteria for the various learning levels. These can be matched to the technological advantages that Dalgarno and Lee offer for 3D virtual learning environments. Incorporating task affordance with learning specifications is often seen as a core element of another unifying concept: learning design. It is opposed to "learning design" or "designing an e-learning system." It is even more dealing with the holistic preparation of structured and specific learning outcomes. Though both frameworks tried to present the virtual learning process, further studies are still needed for a comprehensive teaching-learning model, especially for the virtual setting [45].

Additionally, the study of Cooper et al. [49] aimed to find the perceptions of preservice teachers about virtual reality and its usability in the classroom. This review of the study of Cooper et al. [49] found that most of the preservice teachers were generally favourable about using virtual reality in their classrooms. This is due to the ability of virtual reality, which allows the capacity to interact. Students get motivated to spend more time learning if they are immersed in virtual reality experiences [50]. Teachers are motivated to see virtual reality as more than just a technique in the classroom but as a platform with the ability to change teaching and learning [51]. Also, educators accepted the virtual reality platform's immersive ability, which allows students to examine remote sites, uncover hidden patterns, and modify seemingly intangible frameworks [52].

Furthermore, students will have opportunities that they would not usually have with other learning aids if they use virtual reality systems. Such linear modes of visual media cannot be as effective in maintaining students' interest or resulting in the same substantive learning compared to the immersive and multisensory experience of virtual reality environments [51]. The current state of virtual reality design consistency is a vital consideration to bear in mind. It is indeed one aspect to be passionate about the use of virtual reality. However, without well-designed content that provides students with improved and deep learning, the uniqueness of technology's use will revert to novelty instead of being used for a successful learning experience.

This review for the theme has summarized that though virtual reality has become an essential tool for teaching and learning, its applications are seen in almost every context. However, the proper model or framework is needed to ensure the quality and effectiveness of virtual reality in the classroom. Thus, the framework of Dalgarno and Lee [47], Mayes and Fowler [48], and the combination of both have provided such an appropriate dimension of virtual learning environment that can enhance deeper learning among students.

2.9. Virtual Reality as Architectural Pedagogy. Under this theme, empirical studies were reviewed for understanding the role and application of virtual reality as architectural pedagogy. The study of Bashabsheh et al. [53] aims to test a computer-based software application as virtual reality in teaching architectural course, building construction. Transition and development have been significant in many industries as a result of the emergence of technological tools. Information and communication technology (ICT) is regarded as one of the most relevant resources for developing the learning process in the education field [54]. Thus, it was found as a suggestion that due to the highly rapid advancement of the building sector, as well as the sophistication of project architecture, it is essential to further expand architect teaching through the use of technologies such as interactive virtual reality, animations, and simulation technologies [55]. However, virtual reality and

engagement with a 3D model prototype could end the traditional classroom that is prevalent in conventional educational methods. They also promote beneficial cooperation among the students and instructor in the educational process [54]. Keeping in view the concerns and needs of the current era, this study developed a virtual environment and simulation for teaching building construction to architectural engineers. Thus, they found that the aims of teaching building construction courses are well understood by the students. The modern virtual reality teaching approach seems to have high adoption and educational satisfaction [53]. As a result, if fully immersive technologies have been used in instructional design, particularly in the construction project systems course, students can do much better in construction classes [56].

Furthermore, it concludes that, through virtual world technologies, it is found a critical technique for transitioning from a teacher-centred to student-centred learning approach. Also, students are more interested in transitioning from conventional teaching methods to more effective teaching methods and using a variety of techniques. It has been shown that virtual reality technology is an effective medium for this trend. However, virtual reality technology can be conveniently integrated into all of the architectural program's classes. Furthermore, traditional training methods are tedious and boring, and virtual reality technology is a pleasant way to improve learning enjoyment [53].

This study aims to present a survey of various studies supporting the idea of architectural pedagogy via virtual reality. The review of Milovanovic et al.'s [57] study states that immersion and connectivity are the two pillars of virtual reality [58]. Both are rarely adequately addressed. Virtual reality allows users to feel stimuli and movement in a computer-generated space that mimics some aspects of reality [58]. In the area of architecture, virtual reality applications include a broad range of applications, including planning, building, project collaboration, and decision-making. Also, designers are pushed to properly view space, such as its dynamism and flexibility, by manipulating simulated worlds during development rather than using two-dimensional depictions [59]. Thus, this review found that students who visualized their designs in an immersive world had richer spatial perspectives and improved their design results. The virtual environment was deemed helpful to the students' project design. Therefore, it concludes that using a virtual reality system proved to be successful in improving the efficiency of students' designs, spatial understanding, and the estimation of their design [57].

Hence, virtual reality was found to help transform the conventional method of teaching architectural engineering. It enhances students' motivation, interest, and skills that are otherwise difficult to achieve in a traditional classroom. Also, this helps in developing project design skills among students [53, 57].

2.10. Virtual Reality for Communication Skills. This theme is about the role of virtual reality in developing communication skills among students or users. Under this theme, a review of different studies is presented. A study conducted by Jarmon et al. [60] aims to understand teaching communication by using second life as an application of virtual reality. This study states that digital environments are incredibly immersive because they provide dynamic input, learner experimentation, real-time customizable task collection, and discovery [61]. Virtual environments are often said to have educational advantages, such as enabling imagination in a media-rich climate, promoting teamwork, growing a sense of mutual identity, lowering social anxiety, improving student motivation and participation, and facilitating learners' preferences for their learning [62]. However, experimentation, discovery, role collection, development, and dynamic input are all supported in open virtual environments, such as Second Life, and this welcoming platform means that virtual reality is likely to facilitate the task learning experience. Also, simulated experiences are frequently reported as having cognitive value, including allowing for creativity in a media-rich setting, fostering teamwork, increasing a sense of shared identity, reducing social phobia, enhancing student engagement and interest, and encouraging generation learning [63]. Second Life seems to have the ability to prominently incorporate particular experience-based performative features. It is argued that as people assume ordinary social roles and imitate other people's social roles, the line between playing and play-acting, actual and contribute to making, blurs [64]. Also, user experiences in an interactive virtual environment may have a similar connection to difficulties outside the digital reality, such as professional schooling [65].

Thus, after involving students in virtual reality for their experiential learning, this review's findings illustrate the utility of virtual reality setting for project-based active learning, primarily because students were capable of learning by doing and applying concepts taught in the classroom to real-life situations. The six principles of the Second Life atmosphere that enabled experiential learning through realistic simulations and constructive exploration were (a) the ability to host simulated socializing and partnerships, (b) the ability to enable users to check assumptions by adding them to a project work while doing something practical with none of the risk and expense of the natural world, (c) the potential for simulated actions to be relevant in the physical world, (d) the ability to exercise and display different forms of skills virtually, (e) the enhancement of imagination, discovery, and ingenuity, and (f) a greater sense of personal identity and meaningful knowledge in the virtual world [61]. As some students pointed out, the task-based approach utilizing virtual reality assisted students in making the association between curriculum and reality and theory and implementation. Thus, by the end of the intervention, the student's perceptions of the utility of virtual reality environments for promoting cooperation and coordination had changed. The student team wanted to continue their work in second life to help organizations create a virtual identity for their volunteer activities, perhaps proposing a more significant tangible indicator of their ongoing learning and the importance of this course to their

actual lives. Therefore, it concludes that involving students in collaborative and multiple users in virtual environments, Second Life, helps students develop social skills such as communication. With the help of Second Life or other such platforms, people feel a presence in a particular context and communicate accordingly. Thus, their ability to communicate in a particular environment enhances their communication skills [60].

2.11. Virtual Reality for Reading and Writing Skills. For this theme, different studies' review was carried out to explore virtual reality and its application for developing reading and writing skills among students. The review of the study conducted by Pilgrim and Pilgrim [66] states that teachers often use visuals as scaffolds to help students grasp abstract knowledge and support learning [67]. Visuals have been shown to help with memory retrieval and language acquisition [68]. Nowadays, visualization has become more accessible and more effective using virtual reality-based technologies, such as digital reality apps, still photographs, infographics, and 3D printing. These technologies enable teachers to go beyond using a single image to express context by incorporating virtual reality platforms to have field trip opportunities without having to fly. Thus, teachers may use virtual reality platforms to have more than just material awareness. Teachers should use virtual reality software to allow students to interact with new contexts. With the help of virtual reality, students' prior knowledge can be activated by experiencing such environment and then their reading comprehension as well as writing about the topic enhances. Also, students who lack prior experience will be unambitious to read about a topic [69]. Learners respond to visuals, and teachers can use them to motivate students. With today's technology, we can use virtual reality apps to extend the influence of visuals to provide experiential learning, facilitate comprehension, and scaffold prior information. Teachers' use of technology platforms to foster comprehension of emerging concepts continues to improve so. However, interactive virtual explorations are likely to become an immersive platform for students to discover anything from historical monuments and remote planets to undersea locations and even the human body as more virtual reality applications are released every day [70]. According to research studies, one of the most powerful metrics of how students can understand new knowledge relevant to the subject is what they already know about it [71]. Therefore, virtual reality is an effective tool to encounter immersive clues to get background knowledge, which then helps them comprehend reading and help them write about it [66].

Additionally, the review of another study conducted by Barrett et al. [72] purports to explore virtual reality applications in language acquisition other than English. Its numerous instructional adaptations state that virtual reality is likely to significantly improve learners' interactive and language abilities [73]. However, Second Life is an open interactive digital world in which many users can communicate freely. Digital environments like this have no explicit theme or purpose, leaving it up to the users to discover, develop, or participate in real-time communication [74]. This development of various virtual cultures in such virtual environments allows for language participation in a chosen language that is usually only available to those with the financial means to move to the countries where that particular language is spoken. These features made Second Life and other immersive digital environments appealing hubs for experiences such as community communication, task-based teaching, vocabulary development, problem-based learning, and role-playing in second languages [75, 76] [77]. Thus, the diverse ability of virtual learning environment implementations, such as the social independence provided to users, their robust customization options, and the language exposure provided by their social existence, illustrates the pedagogical potential of virtual learning environments as language acquisition resources. This study found that the attributes of virtual reality have differing degrees of correlation with the structures of technology adoption, but second language learners seemed to be more inclined to use virtual reality as a learning exercise. While virtual reality is a technology with specific characteristics, not all of them have proven to be influential in the development of technology adoption [78]. As a result, activities in the virtual world can enable users to explore and access resources that stimulate their creativity, improving their enthusiasm and understanding of the effectiveness of language acquisition. Also, it is found that learners' desire to engage with a virtual reality learning experience would most likely influence their use of the technology for academic purposes and acquiring language [72].

Therefore, the review under this theme concludes that virtual reality can be practiced as a pedagogical tool for teaching and learning a second language, including its reading and writing skills. Because it provides a virtual environment that helps get prior knowledge for reading and writing about the specific area [66], it also helps get a chance to interact in a particular context for enhancing communication and vocabulary [72].

2.12. Virtual Reality for Social Learning. For understanding the relationship between virtual reality and the social learning of students, a review of different studies was conducted. The review of Feng et al. [79] study aims to theoretically explore teaching survival skills in an emergency by using challenging games as virtual reality. Teaching approaches such as animations, charts, and emergency exercises are widely used to provide information about the proper evacuation strategies, but they may be unreliable in knowledge accumulation and retention. Using challenging games as virtual reality, gamification is a novel approach to learning and development in a gaming world. Interactive virtual reality-based severe games for emergency content distribution and behaviour testing have recently increased interest due to their high engagement and ability to facilitate more significant cognitive development. The word "serious game" typically refers to a computer game primarily intended for education, training, simulation, socialization, exploration, analysis, and advertisement rather than pure

amusement [80]. According to Susi et al. [81], serious games implement digital gaming, operation, and structure towards solving problems encountered by companies and organizations. This type of virtual reality encourages the transition and merge of game development skills and strategies into currently inactive sectors such as teaching.

Compared to nonimmersive virtual reality environments, Krokos et al. [82] discovered that immersive virtual reality would improve the capacity of memory to recall. Also, participants became more concentrated on the mission as a result of the more robust immersion experience. As a result, the immersive virtual reality experience will affect rigid games' components, leading to substantial learning and behaviour outcomes of its unique cognitive mechanism. Immersive virtual reality values should be used to improve challenging games for education and development purposes, classifying them as immersive virtual reality serious games. Interaction is more significant when immersive virtual reality concepts are used in challenging games than when nonimmersive virtual reality serious games are used. Thus, serious games in support of disseminating emergency information and analyzing emergency behaviour are found. The features and function of immersive virtual reality serious games are evident to be effectively applicable for enhancing evacuation education and training for helping them survive in a particular situation that happens in real life [79]. Therefore, this study concludes that immersive virtual reality can be applied in an educational context to teach social skills related to their survival and need in a particular situation or emergency, which may help reduce much loss.

2.13. Virtual Reality for Experiential Learning. In order to understand this theme, several different research studies were reviewed to explore how virtual reality can help students enhance their experiential learning. The review of the study conducted by Freina and Ott [37] aims to understand the role of virtual reality for experiential learning theoretically. It states that virtual reality is used in many adult occupational training situations where the actual case cannot be used for practice either due to the lack of accessibility or the risky nature of the task. An interactive learning process for learning about erosion prevention and management training army personnel is an example [83]. In addition, students' involvement in the immersion of an authentic virtual environment helps in enhancing their experiential learning.

Similarly, virtual reality-based tests with chain management personnel using various devices in preparation scenarios are practiced [84]. The use of virtual reality for technical training of architectural design features construction practitioners [85]. The use of virtual reality as an interactive environment to help the creation of architectural spatial environments is found effective [86]. Also, the virtual reality device of avatars provides a training environment for enhancing pupils' understanding [87]. Virtual reality has been extensively used on a variety of occasions. From nursing profession in an integrated, immersive model to patient learning in a digital hospital, medical professional training, a digital caries extraction exercise for dental students, and a surgery training device that provides a headset and finger monitoring to demonstrate to clinicians the precise gestures of the professional's fingertips throughout surgery [88–90]. Thus, this study found that immersive virtual reality has many benefits for learning; it gives us a first-hand experience of things and activities that are practically out of our control, it helps us to practice in a controlled atmosphere while preventing real-life risks, and it improves the learner's interest and excitement while expanding the number of learning types embraced due to the game approach [37].

The review of another study conducted by Aiello et al. [91] aimed to understand virtual reality as a supporting tool for the teaching-learning process in enhancing students' experiential learning. This study found that the virtual reality environment is formulated as a sensory-motor contact with the world, with the organ serving as the mediator in the process. It is the sensation and vision organ and the kinesthetic structure that constructs knowledge; however, immersion in a virtual environment enables one to use its ability in facilitating learning ultimately. Also, digital reality, like the physical world, allows for complete body interaction, allowing users to visualize the world by perceptual learning. The experiential aspect is one of the steps of a mechanism that contributes to the abstract interpretation of the world. As Kolb and Fry's sensory-motor model [92] appears to clarify the function of engagement, virtual reality is one of the learning techniques suggested to consider instructional innovations that utilize interactive worlds [91]. Thus, in this view of learning, it is apparent that using systems that construct simulated worlds arises in classroom exercises for facilitating learning and uses experimental approaches in which sensory abilities and bodily behaviour communicate in favour of cognitive processes [93]. Therefore, this study reveals that the application of virtual reality offers a broad range of sensory-motor involvement, which helps in the experiential learning of students [91].

The review of another study conducted by Alhalabi [94] aims to analyze the application of virtual reality in helping engineering students learn through experience to enhance their academic achievement. This study found that this strategy helps students experience opportunities that they would not obtain in the actual world due to various factors such as danger, high cost, and a wrong time. The virtual reality method combines imagination with reality by creating virtual worlds that reflect reality, change, and communicate with the students. Furthermore, students' success increases significantly when they use a virtual reality environment. There are a variety of virtual reality applications in the market; the majority of which can be applied in schooling and technologies to enhance students' experiential learning [94].

In addition, the review of another study conducted by Rho et al. [95] posits a computer-assisted language acquisition system that uses virtual reality and feedback based on an evaluation to apply the experiential learning paradigm. This study found that virtual reality as a tool for language acquisition is a more modern trend. Such worlds can be

Table 2: Systematic literature review.

Author and year	Methodology	Contribution	Limitation
Bashabsheh et al. [53]	Experimental	They assessed the use of virtual reality applications in architectural construction education. Virtual reality is more effective in producing student results and their satisfaction.	This study was limited to architectural education only.
Freina and Ott [37]	Review	This is a review of the research literature on the applicability and possibilities of using interactive virtual reality in learning. It found virtual reality as an instructional technology to help enhance learning.	It is only focused on the review of experimental studies, not others.
Elmqaddem [34]	Qualitative	To investigate the impact of virtual reality in creating innovative educational models that best meet the concerns of 21st-century students. Technological developments, such as augmented reality and virtual reality, enable a new form of learning that best fits the needs of 21st-century learners. However, its success is contingent on technological and social factors.	It emphasized 21st-century students' needs. Teachers' needs and their feasibility are not covered.
Bos et al. [96]	Experiment	This study found virtual reality as a valuable tool for advancing specific functional employability capabilities that can be extended to the spatial of data and landscapes, thus improving graduate career opportunities.	Not found
Milovanovic et al. [57]	Review	The use of a virtual reality environment was found to be effective in the performance of student designs.	Not found
Berg and Vance [97]	Survey	To find out how virtual reality is being used in the market for product design and production. Virtual reality was tested in a manufacturing environment. It is well developed, safe, and functional. It has been shown in a variety of sectors to aid judgement and facilitate creativity.	It has only focused on industrial use of virtual reality, and findings are also limited to the security and functionality of virtual reality in the industry. However, other elements of the industry are not highlighted.
Fowler [45]	Review	To use and examine Dalgarno and Lee's learning model in a 3D virtual learning environment as a design for learning. Many creating learning experiences will benefit by using this method in 3D and VLEs with the inclusion of architecture for learning.	The combination of the two models is presented, which is not finalized yet. However, other models are not discussed.
Copper et al. [49]	Case study	To investigate preservice teachers' views on virtual reality and their assumptions about its potential as a teaching and learning platform. Low self-efficacy to use virtual reality in teaching, monitoring-related issues, financial costs, and integrating technology in a healthy and welcoming manner were all concerns.	Preservice teachers were generally more conscious of virtual reality's immersive and interaction potential but less so of its ability to facilitate and encourage interactive learning.
Pilgrim and Pilgrim [66]	Review	To see how virtual reality apps such as Google-related apps and 3D glasses can enhance the students' learning experiences. Google's virtual reality software can be a cost-effective way that provides interactive and observational scaffolding for students.	Only Google-related tools are highlighted.
Aiello et al. [91]	Review	To develop a theoretical basis for the discursive need for virtual reality technology in schools by emphasizing the characteristics of resources that assisted teaching and improved sensorimotor function in learning.	None other than the sensorimotor function of learning is highlighted by using virtual reality.
Tang and Wen [98]	Book review	To review the book and provide the gist of the entire book for making insights regarding virtual reality in education.	No limitation

Table 2: Continued.

Author and year	Methodology	Contribution	Limitation
Feng et al. [79]	Review	The SLR approach was used to create a conceptual structure for successful design and execution. This system connects and combines crucial instructional and mental cognitive elements, playing experience creation, and outcome and participation experience interventions.	Only focused on gamified nature of virtual and connected with pedagogy for making conceptual framework. However, the usefulness of such a framework is not highlighted.
Slater and Sanchez-Vives [44]	Review	Most of the implementations and methods were created to create a virtual reality of the world. Though showing exact truth was impossible, this approach provides the opportunity to venture outside of reality's usual limits and achieve goals in a completely different and unpredictable manner.	The focus of the study was limited to providing outside experiences related to real life, not specifically for education.
Hamilton et al. [32]	Review	According to SLR, a robust analytical approach is needed and the recognition of appropriate evaluation steps. In addition, recognizing the potential of immersive virtual reality as a pedagogical approach requires understanding intervention features and learning outcomes.	Not found
Jarmon et al. [60]	Mixed method	The efficacy of the Second Life setting for a project-based interactive learning approach was discovered in the study, mainly because students were capable of learning by doing and applying knowledge gained in the virtual world.	The study was limited to a particular context.
Le et al. [24]	Case study	Social virtual reality system based building protection was discovered to have much scope for improving learning experiences. Though time-intensive, it could be used as a construction site safety teaching tool.	This study is only focused on safety as social learning. However, social learning is broader.
Rho et al. [95]	Experimental	Virtual reality is in a rare position as a creative tool for self-directed manual language learning. Its commitment and accessibility inspired self-directed learners, implying that the platform is a solid cornerstone for virtual reality-based education.	Not found
Aiello et al. [91]	Review	This is suggested for implementing scientifically based attempts to teach practices and a learning definition aligned with the procedures that these tools can trigger.	Only upper-grade students are focused.
Gandhi and Patel [99]	Review	To investigate the possibilities and obstacles that virtual reality can offer to our lives. It will influence earthly processes on a wide scale in the future and every aspect of everyday life and work.	Only challenges of virtual reality are discussed.
Chang et al. [100]	Pre-post-test design	Virtual reality has a tremendous positive impact on the artistic design process, especially during design and preparation, testing and revision, and reflection and appreciation.	Not found
Abdulrahman et al. [101]	Experiment	The study found that desktop virtual reality role-playing games' users retained more information than those who used the traditional tool. Furthermore, users of immersive and desktop virtual reality role-playing games were more inspired and committed than those who used the traditional form, according to the findings.	Only serious role-playing games are focused.

Table 2: Continued.

Author and year	Methodology	Contribution	Limitation
Barrett et al. [72]	Postparticipation questionnaire	The virtual world seemed to influence learners' perceptions of the technology's convenience of use, implying that more thought should be given to the nature of virtual reality educational experiences and learners' digital literacies in order for such an application to be more effective in teaching.	This study is limited to the Chinese language, not general for any second language.
Alhaladi et al. [94]	Experiment	The study found that virtual reality system helps students in enhancing their achievement in engineering education.	This study is limited to the achievement of students instead of on overall learning.
Kavanagh et al. [25]	Review	To do a comprehensive study about the use of virtual reality in education and two separate thematic analyses: (a) implementation and (b) inspiration. Students' inherent motivation is increased by virtual reality, which refers to a specific set of variables such as constructivist pedagogy, teamwork, and game-based such as their interactions.	This only focused on the constructivist nature of virtual reality. The connection with theory is good, but this study is limited to students' motivation by using virtual reality. However, in constructivism, the role of the teacher also shifts, which is not highlighted.
Bailenson et al. [36]	Experimental	To investigate the usefulness to use virtual worlds to enhance teaching in a digital world by transforming socializing through behaviour and meaning. Via modified social engagement, the virtual world would have the exceptional potential to change the social structure of educational activities.	Only the social nature of learning is focused. However, the way students' socialization will affect other learning is not discussed.

combined with auxiliary equipment such as cameras to make the virtual world's experience more streamlined. Computer-assisted language learning for language acquisition, such as Internet apps and online classes, is more stimulating than conventional second-language classrooms, promoting a feeling of confidence that promotes learning. This computer-assisted language learning covers a virtual learning environment for enabling experience-based learning. Strong communication skills and practical simulations facilitate successful language learning. A virtual learning environment can replicate a multicultural world for a cultural immersion experience. Designing the target language group in a virtual learning environment will overcome structural or motivational barriers in the language learning process [102]. This study reveals that the virtual environment is ideally positioned as a groundbreaking tool for self-directed digital language learning to enhance experiential learning [95].

Another study was conducted by Le et al. [103] for investigating an Internet-based social virtual reality device structure for building protection and education programs that enable students to engage in role-playing, dialectic learning, and social engagement. It states that the building sector is a complex world where high injury rates persist, resulting in significant construction delays in completion [104]. The intrinsic high-risk existence of project construction, minimal protective experience, and inadequate safety training, education, and awareness among construction workers and engineers are significant causes of construction accidents. However, it was noticed that modern security education programs are ineffective since they do not meet their intended markets or are not carried out on a scale that is consistent with their relevance [105]. Also, combining creative teaching with conventional classroom instruction, virtual education, and educational theories and practices significantly improves practical capacity [106]. This shows that a collaborative virtual reality framework dependent on safety management has much potential for improving learning experiences. Schools and teachers, as well as development experts, on the other hand, shared their dissatisfaction with the time-consuming development and animation of game scenarios. Thus, it found that students obtain experiential learning that would otherwise be difficult using virtual reality [103].

The review of Alrehaili and Osman [107] aims to analyze the role of serious games as virtual reality for enhancing students' experiential learning. It states that constructivism philosophy can be applied effectively across gaming channels. The constructivism viewpoint stresses the importance of learning by experience. Active participation in a learning experience has been shown to improve information retention. One of the significances of video games would be that they enable learners to study by role-playing. Players may take on the part of some other human or entity and see the world from different eyes and test their skill and innovation. Also, experiential learning requires active exploration in order to acquire experience. As a result, this study reveals that virtual reality can be an effective didactic medium by

putting the student at the forefront of practical learning interactions for helping them learn experientially [107].

Moreover, the study of Chang et al. [100] aims to examine the effects of virtual reality on the creative experiential learning of students. The review of the study states that students' operational and conceptual skills, as well as reflective and coherent reasoning, can be effectively developed by providing them access to experience computer simulations [108]. Students may miss practical knowledge and real-world experience; combining learning experiences with virtual reality technologies will help validate logical concept analysis and increase learning efficiency and performance [109]. The review of this study found that virtual reality has a significant impact on creative concept outcomes. The scores for artistic architecture and technical appropriateness were, respectively, high and marginal. Virtual reality's practical simulation and concept trial structures permitted students to practise their creativity and imagination freely; thus, their experiential learning was enhanced [100].

The theme review concluded that virtual reality has a significant impact on innovative design practices, especially in the stages of design and preparation, reviewing and updating, and reflection and admiration. The entertaining content of virtual reality and the ability to gain experience by participation in and constructive control of recognizing objects help students learn, retain, and pass concepts. This improves the learner's satisfaction, inspiration, and self-efficacy, enhancing artistic design efficiency and experiential learning. Internet tools or other media should be used in future teaching implementations to strengthen the availability of knowledge or illustrations to improve expertise. Also, it is found that the majority of studies focus on interventions in higher education or vocational education. There has not been any research on small kids or in the area of impairment (Table 2).

3. Conclusion

A computer-generated simulation and animation in which a human may communicate within an artificial world are called virtual reality. Furthermore, the method of learning by interactions is known as experiential learning. Since it includes students explicitly in their learning process, it is classified as part of the broader field of successful learning. Virtual reality is considered helpful as a tool of pedagogy in teaching-learning, including the creative nature of the instructional learning process. It was discovered that integrated virtual reality is typically used in only a few realistic subject areas.

On the other hand, virtual reality intervention was typically brief and isolated, with no accompanying content. Despite this, many studies have shown that immersive virtual reality has a distinct advantage over nonimmersive learning methods. This was particularly valid when the subject matter was abstract or when procedural skills were the focus. Though game-based virtual reality generated the best learning outcomes, games and artificial environments were also essential in enhancing attainment and retention in education. It now allows for another learning process that better aligns with the demands of the 21st-century and digital learners who seek entertainment, collaboration, connectivity, and manipulation of objects. Regardless of whether learning occurs due to experiencing a virtually generated environment, learning is ensured by the educational methodology found in virtual reality demonstration. As a result, the new generation of educators and researchers is tasked with bridging the digital gap and equipping students with the knowledge and competencies they will need to excel in a globalized digital environment. However, a fruitful adaptation to digital and artificial reality in the teaching and learning process could arise once such technical and social issues are resolved. Also, the education process is ideally tailored to take full benefit of these effective technologies.

Digital worlds have been created as a result of rapid advancements in technology. Furthermore, this progress has enabled it to be integrated into a variety of areas, including education. Virtual reality in education has enabled teachers and students to engage with abstract and interactive environments in immersive first-hand experiences. As a result, it has improved students' academic success by offering rich qualitative and need-based virtual exposure to the physical world [36, 44]. Even though virtual reality has become a popular medium for teaching and learning, its implementations can be used in almost any environment. However, to ensure the consistency and efficacy of virtual reality in the classroom, a suitable model or structure is needed. Thus, the frameworks of Dalgarno and Lee [47], Mayes and Fowler [48], and their combination have created an appropriate dimension of interactive learning experience that can help students study more deeply. As a result, virtual reality was discovered to be effective in changing the traditional approach to teaching. It boosts students' morale, curiosity, and talents, challenging to attain in a typical classroom. It lets students improve social skills such as teamwork by involving them in shared and multiple user virtual worlds—Second Life. People may sense their existence in a specific situation and interact appropriately using Second Life or other similar platforms. As a result, their ability to engage in a specific context improves their communication abilities [60]. Digital reality should be used as a teaching and learning medium for a second language, including reading and writing skills, since it offers a virtual platform that aids in the acquisition of preliminary information for reading and writing about a specific topic [66], as well as the opportunity to engage in a specific context and improve connectivity and vocabulary [72].

Simulations and interactive virtual reality can be applied in educational settings for teaching coping skills relating to life and what they need in a specific circumstance or disaster, potentially saving lives. Virtual reality has a profound influence on creative design practices, especially during planning and design stages, evaluating and upgrading, and contemplation and appreciation. Virtual reality's engaging content and the opportunity to gain knowledge by involvement in and positive control of identifying things aid students in learning, remembering, and passing concepts. This boosts the learner's happiness, creativity, and self-efficacy, which help with creative design and experiential

learning. In the future, Internet tools or other media should be used to increase the availability of information or illustrations to enhance skills. Furthermore, the majority of findings are found to focus on interventions in higher education or technical education. There has been no literature on young children or in the field of disability.

Data Availability

The data that support the findings of this study are available from the corresponding author upon reasonable request.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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