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Work-in-Progress—The Metaverse Campus: Transforming Learning for International Students

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Abstract. As the number of international students studying in the US keeps increasing, schools should be responsive to the students' needs and wants. These needs include cultural shock, language barriers, and social adjustments in order to adapt to the new environment.
In this a work-in-progress paper, we will discuss the potential implementation of immersive learning technologies, such as VR, AR, or the Metaverse, to address these challenges of social adjustments that many international students face as they arrive in the US to continue their education. The study provides insights to innovate traditional ways of dealing with international students to ensure a more meaningful and authentic learning experience.

Keywords: International Students, Metaverse, Learning, Virtual Reality.

1 Introduction

Over the past few years, US higher education is becoming the more popular place for students coming from all over the world to seek a high quality education [1]. Despite its popularity, international students need help adjusting to the new learning environments as they arrive in the US and try to fit in. Examples of these challenges include cultural shock and social adjustment [2], English language competency to communicate effectively in the new country [3], and emotional feelings of isolation and separation of family and friends [4]. These challenges could lead to mental health problems affecting students' overall performance and learning gain. To overcome these challenges, it is better to have international students learn about cultural differences and expectations before arriving at the US school destination. One way of doing this is utilizing innovative technologies, such as immersive learning environments of virtual reality (VR), augmented reality (AR), or the metaverse. Virtual reality and computer simulations are gaining significant attention as powerful learning tools in several science fields and contexts, such as medicine, engineering, and aviation, but their applications in humanities and traditional higher education settings still need to be addressed. Integrating VR into education would have a great potential to expand knowledge gain and facilitate experiential learning beyond the spatial and temporal dimensions of the school enterprise [5, 6], making international students more comfortable upon their arrival in the U.S.. By replicating a VR campus, students will become more familiar with the social norms of their destination country, the locations of important buildings, and how to effectively use the campus's resources, which could better prepare them for their new educational journeys.

In this paper, we aim to explore how the metaverse campus could transfer the learning experiences for international students. We will first discuss the common challenges many international students face while studying in the US. Then, we will explore the revolution of the metaverse at large and highlight its potential benefits to enhance the learning experience for diverse learners in specific. Emphasis will be given to the use of the metaverse concept to resemble the US campus in a virtual form and thus aid future students in accommodating and adjusting to the new campus life. The paper will conclude with insights and thoughts to develop an agile-powered framework for the best VR learning adoption in higher education campuses.

2 The Metaverse Revolution

The phrase "metaverse" refers to an interconnected 3-D dimensional virtual environment allowing users to interact with each other and the software agents as if they are in the real world [18, 19]. This virtual realm has its own rules and limitless possibilities. Unlike VR, which can also create an interactive virtual world, the metaverse is unique by allowing individuals as digital avatars to live a purely virtual existence playing, learning, working, interacting, or even getting entertained [7]. Despite its recent emergence, the metaverse has been widely implemented across different applied scientific disciplines, such as health, engineering, science, space, cryptocurrencies, museums, and education [8, 21-23]. In education, the metaverse can boost student achievement by offering them opportunities to learn by doing [8-11]. Despite these implementations to enhance learning, the use of metaverse to resemble the campus experience has not been adequately explored yet. A virtual campus with a fully three-dimensional environment would allow international students to explore the campus and its related services from anywhere and at any time. With the virtual campus, the external publicity of the school is no longer limited to traditional propaganda methods such as words and pictures, which makes the representation of the school shown very limited. Instead, the virtual campus will become more real by engaging multiple senses of interaction. Consequently, being immersed in campus activities early on will help international students to overcome social adjustment challenges and adjust easily to the new lives in their destination countries.

3 Benefits of the Metaverse for International Students

Creating virtual and immersive learning environments driven by advanced technologies can benefit international students largely at different levels. These innovative spaces offer international students multiple opportunities to be more connected, engaged, better communicators, high achievers, culturally competent, and valued. In what follows, we will elaborate further on these points.

3.1 Sense of Belonging

Each individual would want to feel accepted, honored, appreciated, and supported in their chosen place, and so international students do. This mixed feeling of security, inclusion, and support creates a sense of belonging. Experiencing a sense of belonging is not merely tied to socializing in physical spaces but can also be achieved in well-designed virtual reality spaces. Through the real immersion experience, international students would obtain this feeling by actively interacting in the imaginary digital environment and thus gain feelings of acceptance, attention, and support. Previous studies by Liu and colleagues [12] have created a virtual environment to resemble one of the US campuses and came up with interesting findings. In particular, they found that VR enabled students to move freely in all directions, view the environment from various points of interest, and interact with people from different perspectives. They further indicated that this intervention helped students to feel more connected to their school and have a sense of belonging. A sense of belonging is vital for international students, especially if they do not live in a homogenous society with shared beliefs and cultural values. In alignment with situated learning theory, learners learn best when they feel they belong to a community of practice where knowledge is situated. Apparently, the immersive learning environment would help international students to be fully immersed and situated in the virtual environment to learn, discover, engage, articulate, and reflect while making sense of their surroundings.

3.2 Leveraging Engagement

Transporting international students to an immersive learning experience with multiple sense modalities; would have a great potential to leverage engagement. In such situations, international students would be more likely to engage and interact in the environment, especially when this environment is well-designed and enormously appealing [13]. Studying learners' engagement in the metaverse and other virtual and mixed-reality environments has recently captured the attention of many educators and researchers. In one of the previous studies, Ku and colleagues did an experiment to examine the impact of using a mixed-reality integrated learning environment to train teaching assistants in one of the higher education institutions [14]. They found that studying with VR may generate more internal motivation to engage and continue learning than those in traditional settings, making learning more enjoyable, effective, and fun to do [14]. In another clinical nursing training, other researchers found that nurses trained via VR did better and stayed longer in the clinical program than those trained in traditional methods [15]. Keeping learners engaged can significantly improve sustainability and retention across all higher education institutions.

3.3 Communication Skills

The metaverse-based learning environment not only increases the sense of belonging and level of engagement, but it can also help improve international students' communication skills. Developing effective communication skills is essential for all students, more importantly for English language learners. Without clear speaking skills, ESL learners will not be able to communicate their basic needs and demonstrate their understanding. Immersive learning can enhance communication skills with its capabilities to foster an immersive experience that includes contextualized authentic learning, instructor coaching, peer collaboration, critical thinking, and reflection [13]. Simulated-based learning would also provide students with immediate feedback using machine learning algorithms and artificial intelligence (AI) techniques to scaffold learning and bring students up to speed [8].

Another important aspect of communication is writing proficiency. Writing is very significant for ESL learners in order to communicate their thoughts and ideas at a higher level and have their voices heard. Several studies have previously shown promising outcomes when using VR to assist international students' writing and critical thinking skills. For instance, Abdelrahim did an experiment to examine critical thinking writing skills among second language learners at the undergraduate level [2]. He immersed the students in the experimental group in an augmented reality environment that is equipped with effective strategies and tips, and the control group was in a different environment. In comparison between the two groups, the study revealed that there was a considerable improvement in the critical thinking and writing skills of the students in the experimental group compared to those in the control group. Similarly, Chen and colleagues [7] discovered that VR technology helped improve students' self-perception in descriptive writing. These results suggest that immersive learning environments can lead to better oral and written communication.

3.4 Beyond Temporal and Spatial Boundaries

Meaningful learning should not be confined to time or space boundaries. Instead, it should occur anytime and anywhere. For this to happen, there is a need for real immersion learning that is readily available and always accessible at the moment, such as VR or metaverse-based learning. These innovative environments could break down temporal and spatial boundaries by having a variety of locations and different duration of time to learn anytime and anywhere [16]. In this type of innovative learning, students should create their own space and manage their own time since new technology continues shaping the perception and definition of campus space for international students. Based on that, the instructor or institution should always try to assemble the nearness through a temporary assemblage of people, circumstances, and technologies.

3.5 Academic Success and Cultural Competence

Academic success is the ultimate goal for every learner, young or old, native speakers or second language learners. Success can be accomplished seamlessly when providing the appropriate learning environments, such as VR, AR, and the Metaverse. Several studies have shown how innovative technologies can support academic success and improve language learning outcomes. For instance, a study [7] discovered that a 3D VR English language learning platform improved students' phonology, morphology, grammar, and syntax abilities. Furthermore, a study [20] found that the VR platform ImmerseMe improved university students' English language learning abilities to perform well in assignments. The use of VR and the metaverse does not only improve learning performance but also cultural competence and awareness. For instance, the University of Lorraine's UFR has implemented VR sessions to raise non-specialist students' cultural awareness and found promising outcomes [6]. Similarly, a study [11] discovered that using a VR tool has improved the communication and cultural awareness of the Iranian EFL learners they studied.

Reimagining VR and the metaverse in a virtual campus can transform the international learning experience at different levels. It helps international students overcome common challenges and barriers of language variations, social norms, access to services, and feeling of isolation. Despite that the fact that most results were mostly positive, there were some other limitations and challenges, such as technical requirements and keeping the immersive learning environment interactive and current [7].

4 Reflection and Conclusion

Metaverse and VR learning have received increased attention across different domains to transform the user experience beyond space and time elements of learning and keep learners highly engaged. However, these studies were conducted to augment only one specific context in the bigger system or a class at the school; the potential for scalable virtual learning experiences for international students has yet to be fully explored. Therefore, we

aimed to raise awareness about the metaverse's implications to enhance newcomers' learning experience. In our future research, we hope to develop a set of frameworks to guide educators and learning designers on how to build an effective metaverse environment that reflects diverse students' needs. In doing so, we will build on exciting models, such as the work of Duan, Haihan, et al. [17], who developed a university campus prototype, as a foundation for further exploration and refine these models to be more agile and reflexive to learners' needs. We will also examine international students' perceptions of being in a metaverse campus and how this intervention – if to be developed – would help learners adjust to the new life on the US campus.

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