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Research Paper

Exploring the Integration of the Metaverse in Business Model Design Education: Enhancing ESL Learners' Language Acquisition and Proficiency in Higher Educational Institutions

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Abstract

The Metaverse technology and tools have considerably increased pedagogical and technological support for education by providing immersive learning opportunities, however, emphasize on metaverse technology among Pakistani universities is ignored by the practitioners as well as academicians. Therefore, this study is one of the steps to introduce metaverse technology among English as Second Language (ESL) learners to improve education related to business model design. To achieve the objective, this study considered the role of video education, video recording and students language acquisition and proficiency in business model design. Primary data was collected by using a survey among Pakistani universities. Various statistical tools were used to examine the role of metaverse video education, video recording and students' language acquisition and proficiency in business model design. Findings identified the positive contribution of metaverse to business model design through video education, video recording and student language acquisition and proficiency.

Introduction

The metaverse is a word for virtual worlds in which users represented by avatars interact, usually in 3D and centered on social and economic connections (Dionisio, Iii, & Gilbert, 2013; Nevelsteen, 2018). Along with the other fields, metaverse is emerging in the education field (Oliver et al., 2013). The use of metaverse in educational institutions is increasing significantly, which has valuable importance. Several previous studies also highlighted that metaverse is one of valuable roles in educational institutions (MacCallum & Parsons, 2019; Maharg & Owen, 2007). It helps the student to learn with the help of technology. However, the importance of metaverse in educational institutions is ignored by previous studies.

Metaverse technology and tools have considerably increased pedagogical as well as technological support for education by providing immersive learning opportunities, hence positively increasing student motivation. The growth in educational innovations (Chou et al., 2019; Earl & Timperley, 2015; Mata et al., 2019) can be improved with the help of metaverse introduction among the educational institutions. Figure 1 classifies technology and tools into seven categories: wearable, immersive, educational, modeling and simulation, mobile, sensors, and artificial intelligence (AI). As there is important relationship between metaverse and AI (Nunes et al., 2017; Rathore, 2017, 2018). The immersive direct experience that students receive in the Metaverse promotes teamwork and skill development while also engaging students in a variety of educational activities. Therefore, the promotion of metaverse in education has important benefits. Metaverse can help to introduce incorporate virtual technologies including Virtual Reality (VR), Multi-User Virtual Environment (MUVE), Mixed Reality (MR), and Augmented Reality (AR), which are essential for immersion.

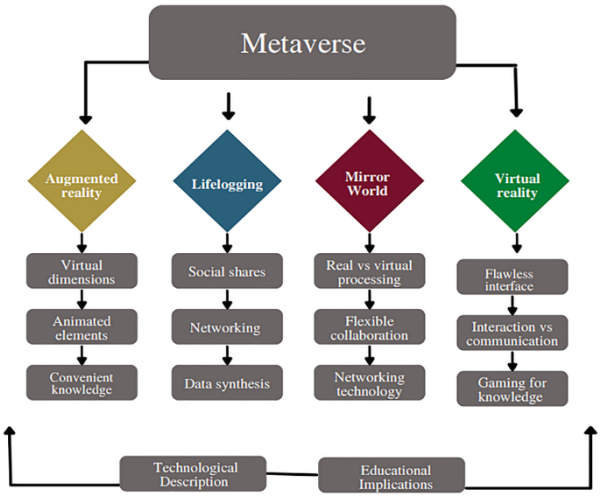

Figure 1: The Four Elements of Metaverse and Their Educational Implications.

Students' learning context undoubtedly influences how fast they learn in English as Second Language (ESL) context

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(Fareed, Ashraf, & Bilal, 2016; Farooq, Uzair-Ul-Hassan, & Wahid, 2020; Fauzan, 2019; Lee et al., 2017). By providing a vivid description of English language learning in Pakistani context, one can be sensitive to and understand how challenging it is to learn English. Students require special intention to promote the level of English language (Lee et al., 2017; Teng & Zhang, 2018). However, it is not the purpose of this study to foresee Pakistani English major students' problems of writing skills, this study is focusing on the students of metaverse business design which was never studied by previous studies. Such type of exploration would yield more comprehensive findings which in turn will be beneficial for future development in terms of teaching methodology as well as trainings relevant to the field (Bruce et al., 2010). Furthermore, Figure 2 highlighted the global metaverse market report in which expected growth is reported till 2031.

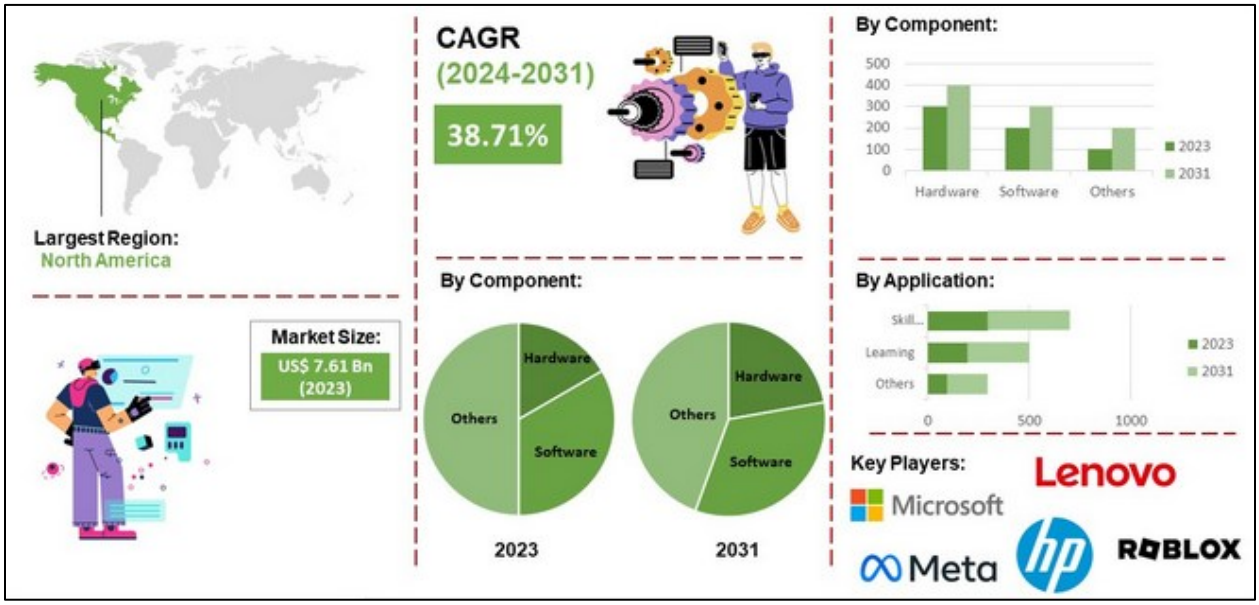

Figure 2: Global Metaverse Market Report (Expected Growth till 2031).
Source: Insightace Analytic

The purpose of this study is to introduce metaverse technology among ESL learners to improve education related to business model design. To achieve this purpose, this study considered the role of video education, video recording and students language acquisition and proficiency in business model design. This study has potential to transform educational system among Pakistani universities by introducing by using metaverse technology in video education and video recording. The delivery of lectures through video education and video recording can increase the student's language acquisition and proficiency. Hence, this study has key importance for academicians to enhance language skills among the students.

Literature Review

The metaverse technology delivers a dynamic and immersive learning environment that can meaningfully benefit ESL learners in Pakistani universities. Most importantly, it has the ability to transform the education system among universities through virtual reality (VR) and augmented reality (AR), students can engage in different interactive language practice (Mekacher, 2019; Wei, 2019), permitting them for real-time communication in simulated environments. This hands-on experience improves their listening and speaking as well as comprehension skills by revealing them to diverse accents and cultural contexts. Additionally, virtual reality (VR) can foster various educational activities (Elmqaddem, 2019; Huang et al., 2019). Instructors can create virtual classrooms or language labs where students cooperate, role-play, and contribute to problem-solving tasks, inspiring active learning. The metaverse also offers tailored learning paths for students and teachers, allowing students to practice at their own pace, nurturing confidence in language use. Furthermore, it promotes a sense of community as well as engagement, plummeting the intimidation factor often associated with language learning in old-style settings.

In language learning, linguistic knowledge and strategic knowledge is vital importance which can be promoted through technology (Ghapanchi & Taheryan, 2012; Zhang et al., 2019). Though both linguistic knowledge as well as strategic knowledge are interconnected and significant in producing a good piece of writing, these two important types of knowledge are from within the learners themselves. These types of knowledge can be gained through promotion of innovative technology (Chou et al., 2019; Lüthje & Franke, 2002) through metaverse introduction in educational industry. Those who believe in this knowledge alone can highlight on writing rules or imitation of writing work from experts in their vital teaching activities as compared to using such knowledge for real

purpose. The growth in learning is not only possible to believe only in knowledge because the transfer of knowledge also require technology such as metaverse video education and video recording for students. Actually, learning to write includes more than just cognitive engagement. Writing is an important part of communication and language learning which require special skills. Writing skills cannot be learned self-sufficiently from learners‟ environment (Alkubaidi, 2014; Amiramini, Ghanbari, & Shamsoddini, 2015; Izawa et al., 2017; Nik et al., 2010; Teng & Zhang, 2018). Various factors of cultural, educational and social contexts which students come into contact with will definitely influence their language learning development, and writing is part of language learning. These factors play imperative roles in providing their writing inputs.

In education, the Metaverse incorporates institutional learning management systems (LMS), HotPotatoes, MOOCs, Moodle, Teleduc, Eduquito, and Sloodle (Saputro & Susilowati, 2019; Shukla, Sharma, & Saggu, 2019). Massive Open Online Courses (MOOCs), for example, provide students with access to a social network through Web 2.0 and AVAS technologies. All these platforms have the vital importance among the universities to introduce important technology. However, the implementation of this type of technology is also a challenge for institutions. Many students may now obtain subject information for free thanks to the Metaverse and MOOCs, and online courses permit them to expand their knowledge. Different types of mobile technologies are thought to be the most prevalent in the Metaverse because they permit for a connection between the medium as well as the student via mobile devices and geographic mobility. In this case, the implementation of technology related to metaverse is most important. Students can advance their learning progressions by using their Metaverse avatars on mobile devices. Sensors as well as wearables, such as Microsoft HoloLens2 smart glasses and eye blinking, are one type of technology that permits teachers to monitor student dynamics by assessing student behavior. Figure 3 highlighted the generic video processing framework which can be implemented in Pakistani universities.

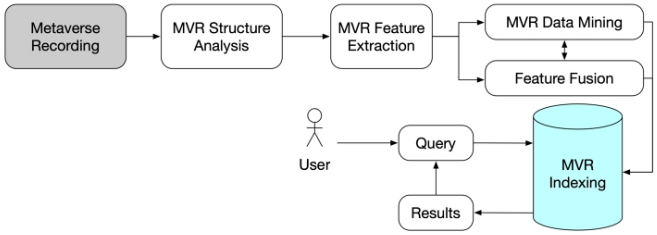

Figure 3: Generic Video Processing Framework.

Education is considered rudimentary right of each student globally (Rahim, 2019). It covers an individual to get as well as fruitful for the future success in various field of life, most important business fields (Hussain & Javed, 2019). However, quality education is most important which can be achieved through better technology among educational institutions in which metaverse enabled recording is important. Furthermore, the quality of education assurance for each student deprived of any gender predispositions (Wu et al., 2019), consequently it can produce a chance to generation powers to overcome. This is possible with the availability of good technological resources in universities (van der Kamp, 1997). Figure 4 illustrates how extension points are employed in metaverse enabled recording. The entire process is based on a workflow. Plugins encompass structural analysis, producing features that can be merged before proceeding to the next processing stage.

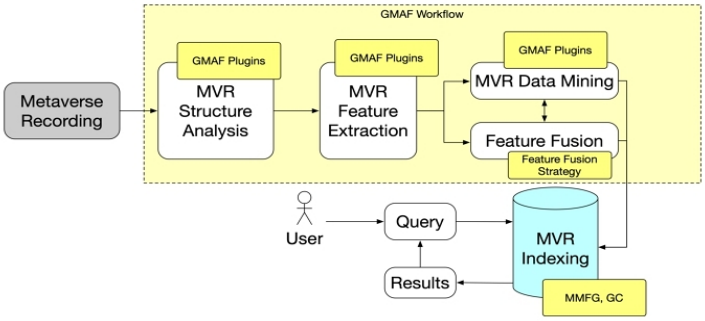

Figure 4: Extension Points Used in Metaverse Recording.

The comparison between various types of technology is most important while implementing among the universities for the promotion of learning. Evaluation means a standard which is distinguished by using comparison as well as definite student's capability in evaluation is more to be related with proper influences to solve any problem or various interrogation. In this direction, the introduction of metaverse video education and metaverse video recording is most significant which was ignored by the previous studies. Another characteristic of explanation is the capability to explain conceptual,

methodological as well as considerations upon the result based on existing judgment. Finally, this study introduced the role of video education, video recording and students' language acquisition and proficiency in business model design which is reflected in the following hypotheses:

Hypothesis 1 (H1): *Metaverse video education has a positive contribution to student language acquisition and proficiency.*

Hypothesis 2 (H2): *Metaverse video recording has a positive contribution to student language acquisition and proficiency.*

Hypothesis 3 (H3): *Language acquisition and proficiency has a positive contribution to student metaverse business model design.*

Methodology

This study examined the relationship between video education, video recording and students' language acquisition and proficiency in metaverse business model design. Three hypotheses were proposed to examine this relationship. The variables used in this study (i.e., metaverse video education, metaverse video recording, students' language acquisition and proficiency in metaverse business model design) were not considered by the previous studies. Therefore, this study preferred to develop new measures to examine the relationship. The scale items developed for each variable is a follows:

Business Model Design

1. I can develop metaverse business model.
2. I can implement metaverse business model.
3. I always prefer the development of metaverse business model.

Language Acquisition and Proficiency

1. My language acquisition is high due to metaverse technology.
2. My language proficiency is high due to metaverse technology.
3. I am more efficient because of metaverse learning technology.

Metaverse Video Education

1. Metaverse video education helps me in learning.
2. Metaverse video education helps me with training activities.
3. Metaverse video education helps me in skill development.

Metaverse Video Recording

1. Metaverse video recording is helpful in recalling lectures.
2. Metaverse video recording is helpful in learning through recorded lecturers.
3. Metaverse video recording is the best for me to improve my skills.

Questionnaires were distributed among the students of business model design among the universities listed in Table 1. Survey was carried out through self-visit to these universities. Five hundred (500) questionnaires were used in the survey. Simple random sampling was used for the distribution of questionnaires. Out of Five hundred (500) questionnaires, 305 questionnaires were returned, however, all questionnaires were not usable. Two hundred and seventy-three (273) questionnaires were found valid and used for data analysis.

Table 1: Universities Included in the Sample of the Current Study.

University	Location	Established	Specialization	Type
1 University of the Punjab	Lahore	1882	General	Public
2 King Edward Medical University	Lahore	1860	General	Public
3 University of Engineering and Technology, Lahore	Lahore	1921	General	Public
4 Forman Christian College University	Lahore	1864	General	Private
5 National College of Arts	Lahore	1875	Arts & Design	Public
6 University of Veterinary and Animal Sciences	Lahore	1882	General	Public
7 Punjab Tianjin University of Technology	Lahore	2018	Engineering & Technology	Public
8 Kinnaird College for Women University	Lahore	1913	General	Public
9 Government College University, Lahore	Lahore	1864	General	Public
10 Lahore College for Women University	Lahore	1922	General	Public
11 Fatima Jinnah Medical University	Lahore	1941	Medical	Public
12 Pir Mehr Ali Shah Arid Agriculture University	Rawalpindi	1970	General	Public
13 Fatima Jinnah Women University	Rawalpindi	1998	General	Public
14 Rawalpindi Medical University	Rawalpindi	1974	Medical	Public
15 National University of Medical Sciences	Rawalpindi	2015	Medical	Public
16 Rawalpindi Women University	Rawalpindi	2019	General	Public
17 Government Viqar-un-Nisa Women University	Rawalpindi	2022	General	Public
18 University of Agriculture, Faisalabad	Faisalabad	1906	General	Public
19 Namal University	Mianwali	2008	Engineering & Technology	Private
20 Government College University, Faisalabad	Faisalabad	1897	General	Public
21 National Textile University	Faisalabad	1959	General	Public
22 Bahauddin Zakariya University	Multan	1975	General	Public
23 The Islamia University of Bahawalpur	Bahawalpur	1925	General	Public
24 University of Engineering and Technology, Taxila	Taxila	1975	General	Public
25 Lahore University of Management Sciences	Lahore	1984	General	Private
26 NFC Institute of Engineering and Technology	Multan	1985	Engineering & Technology	Public
27 Institute of Management Sciences, Lahore	Lahore	1987	General	Private
28 University of Management and Technology, Lahore	Lahore	1990	General	Private
29 National College of Business Administration and Economics	Lahore	1994	General	Private
30 University of Central Punjab	Lahore	1999	General	Private
31 University of Sargodha	Sargodha	1916[4]	General	Public

32 University of Health Sciences, Lahore	Lahore	2002	General	Public
33 University of Education	Lahore	2002	General	Public
34 GIFT University	Gujranwala	2002	General	Private
35 Hajvery University	Lahore	2002	General	Private
36 Faisalabad Medical University	Faisalabad	1973	Medical	Public
37 University of Faisalabad	Faisalabad	2002	General	Private
38 University of Lahore	Lahore	1999	General	Private
39 Beaconhouse National University	Lahore	2003	General	Private
40 University of South Asia	Lahore	2003	General	Private
41 University of Gujrat	Gujrat	2004	General	Public
42 Superior University	Lahore	2000	General	Private
43 Minhaj University, Lahore	Lahore	1986[5]	General	Private
44 HITEC University	Taxila	2007	General	Private
45 University of Wah	Wah	2005	General	Private
46 Pakistan Institute of Fashion and Design	Lahore	1994	Arts & Design	Public
47 Women University Multan	Multan	2010	General	Public
48 Institute of Southern Punjab	Multan	2010	General	Private
49 Qarshi University	Lahore	2011	General	Private
50 Government College Women University, Sialkot	Sialkot	2012	General	Public
51 Government Sadiq College Women University	Bahawalpur	2012	General	Public
52 Ghazi University	Dera Ghazi Khan	2012	General	Public
53 Government College Women University, Faisalabad	Faisalabad	2012	General	Public
54 Information Technology University of the Punjab	Lahore	2012	Engineering & Technology	Public
55 Muhammad Nawaz Sharif University of Agriculture	Multan	2012	Agriculture & Veterinary	Public
56 Muhammad Nawaz Sharif University of Engineering and Technology	Multan	2012	General	Public
57 Virtual University of Pakistan	Lahore	2002	General	Public
58 Lahore Garrison University	Lahore	2010	General	Private
59 Cholistan University of Veterinary and Animal Sciences	Bahawalpur	2014	Agriculture & Veterinary	Public
60 Khawaja Fareed University of Engineering and Information Technology	Rahim Yar Khan	2014	Engineering & Technology	Public
61 Punjab University of Technology, Rasul	Mandi Bahauddin	1873	Engineering & Technology	Public
62 University of Sahiwal	Sahiwal	2015	General	Public
63 University of Okara	Okara	2015	General	Public
64 University of Jhang	Jhang	2015	General	Public
65 NUR International University	Lahore	2015	General	Private
66 University of Sialkot	Sialkot	2013	General	Private
67 Lahore School of Economics	Lahore	1997	Medical	Public
68 University of Home Economics Lahore	Lahore	1955	General	Public
69 Mir Chakar Khan Rind University of Technology	Dera Ghazi Khan	2019	Engineering & Technology	Public
70 Institute for Art and Culture	Lahore	2018	Arts & Design	Public
71 University of Narowal	Narowal	2018	General	Public
72 Al-Qadir University[6][7]	Sohawa	2021	Sufism	Public
73 Baba Guru Nanak University	Nankana Sahib	2021	General	Public
74 University of Chakwal	Chakwal	2020	General	Public
75 University of Mianwali	Mianwali	2012	General	Public
76 Thal University	Bhakkar	2012	General	Public
77 Green International University	Lahore	2020	General	Private
78 Kohsar University Murree	Murree	2020	General	Public
79 Lahore Institute of Science and Technology	Lahore	2022	General	Private
80 Grand Asian University Sialkot	Sialkot	2022	General	Private
81 The University of Chenab	Gujrat	1999	General	Private
82 International Institute of Science, Art and Technology	Gujranwala	2022	General	Private
83 Institute of Management & Applied Sciences	Khanewal	2017	General	Private
84 University of Layyah	Layyah	2009	General	Public
85 Rashid Latif Khan University	Lahore	2021	General	Private
86 Multan University of Science & Technology	Multan	2022	General	Private
87 Times Institute	Multan	2008	General	Private
88 Nishtar Medical University	Multan	1951	Medical	Public
89 Emerson University, Multan	Multan	1920	General	Public
90 Ghazi National Institute of Engineering & Sciences	Dera Ghazi Khan	2021	General	Private
91 University of Sahiwal	Sahiwal	2015	General	Public

Findings

Findings of the study are grounded on the statistical results. Before to examine the relationship between metaverse video education, metaverse video recording, students' language acquisition and proficiency and metaverse business model design, it is important to examine the reliability and validity of the scale items which is known as individual item reliability. Table 2 highlighted the individual item reliability. All the scale items have factor loading higher than 0.7 which confirmed that all the scale items are reliable (Cheah et al., 2018; Hair Jr et al., 2014; Henseler et al., 2014; Maqbool et al., 2019; Ringle, Sarstedt, & Straub, 2012). The scale items along with factor loading is also reported in Figure 4.

Table 2: Individual Item Reliability.

Constructs	Items	Individual Item Reliability
Business Model Design	I can develop metaverse business model.	0.777
	I can implement a metaverse business model.	0.702
	I always prefer the development of metaverse business model.	0.798
Language Acquisition and Proficiency	My language acquisition is high due to metaverse technology.	0.801
	My language proficiency is high due to metaverse technology.	0.752
	I am more efficient because of metaverse learning technology.	0.769
Metaverse Video Education	Metaverse video education helps me in learning.	0.811
	Metaverse video education helps me with training activities.	0.822
	Metaverse video education helps me in skill development.	0.732
Metaverse Video Recording	Metaverse video recording is helpful in recalling lectures.	0.796
	Metaverse video recording is helpful in learning through recorded lecturers.	0.856
	Metaverse video recording is the best for me to improve my skills.	0.795

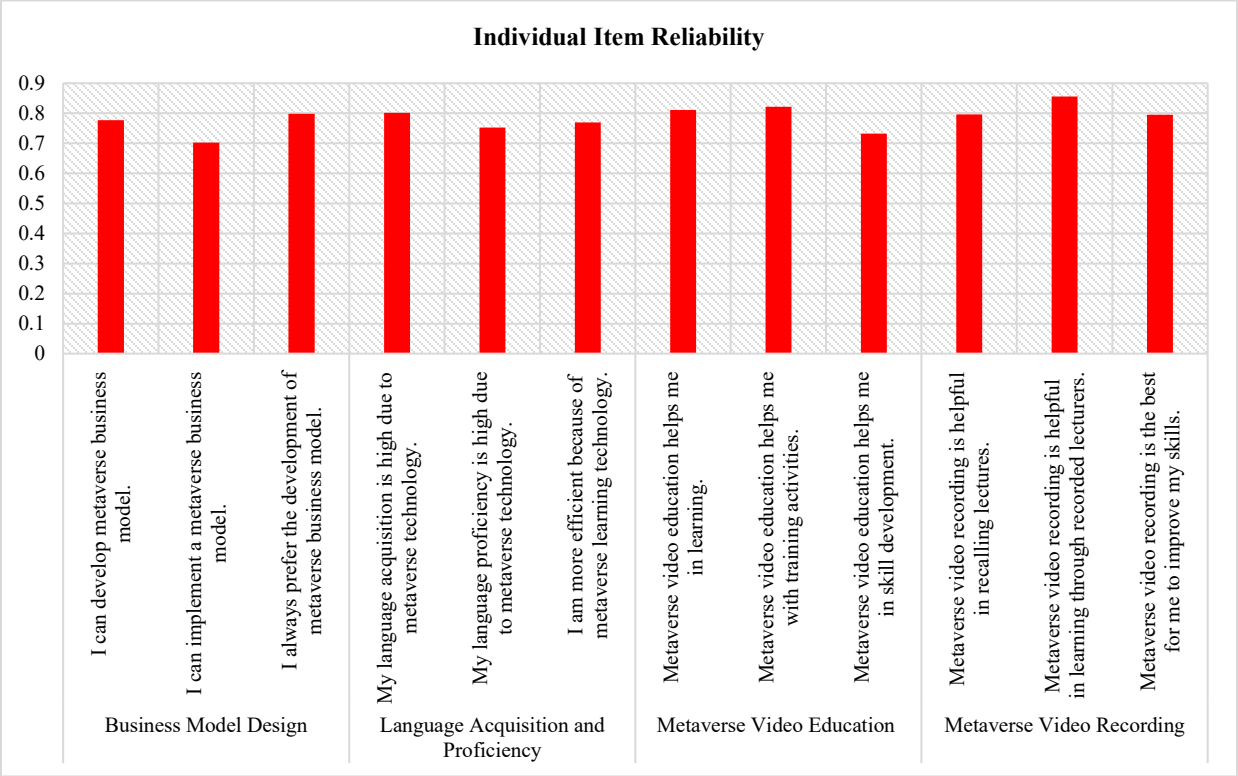

Figure 5: Individual Item Reliability.

Furthermore, before to examine the relationship between metaverse video education, metaverse video recording, students' language acquisition and proficiency and metaverse business model design, it is important to confirm composite reliability (CR) and average variance extracted (AVE) which should be higher than 0.7 and 0.5 (Ali & Kim, 2015; Cheah et al., 2018; Kock, 2015; Ringle et al., 2012; Streukens & Leroi-Werelds, 2016), respectively. All the values of CR and AVE are higher than 0.7 and 0.5, respectively, as reported in Table 3. These values also confirmed the convergent validity (Alarcón, Sánchez, & De Olavide, 2015; Anis et al., 2020; Cheah et al., 2018; Cowin et al., 2008). Discriminant validity is reported in Table 3 with the help of HTMT (Alarcón et al., 2015; Henseler, Ringle, & Sarstedt, 2015).

Table 3: HTMT, Composite Reliability (CR) and Average Variance Extracted (AVE).

Constructs	Business Model Design	Language Acquisition and Proficiency	Metaverse Video Education	Metaverse Video Recording	CR	AVE
Business Model Design					0.755	0.522
Language Acquisition and Proficiency	0.521				0.788	0.555
Metaverse Video Education	0.499	0.444			0.701	0.602
Metaverse Video Recording	0.621	0.541	0.555		0.802	0.588

Finally, after the assessment of reliability and validity, this study examined the relationship between metaverse video education, metaverse video recording, students' language acquisition and proficiency and metaverse business model

design. Results are reported in Table 4 and Figure 5. These results are based on beta value (β) and t-value. T-value should be higher than 1.96 to accept the hypothesis and beta value (β) value was used to check the direction. All the three hypotheses were found supported (see Figure 6).

Table 4: Results.

Hypothesis	β	T-Value	Decision
H1	0.205	2.891	Accepted
H2	0.085	2.251	Accepted
H3	0.362	3.652	Accepted

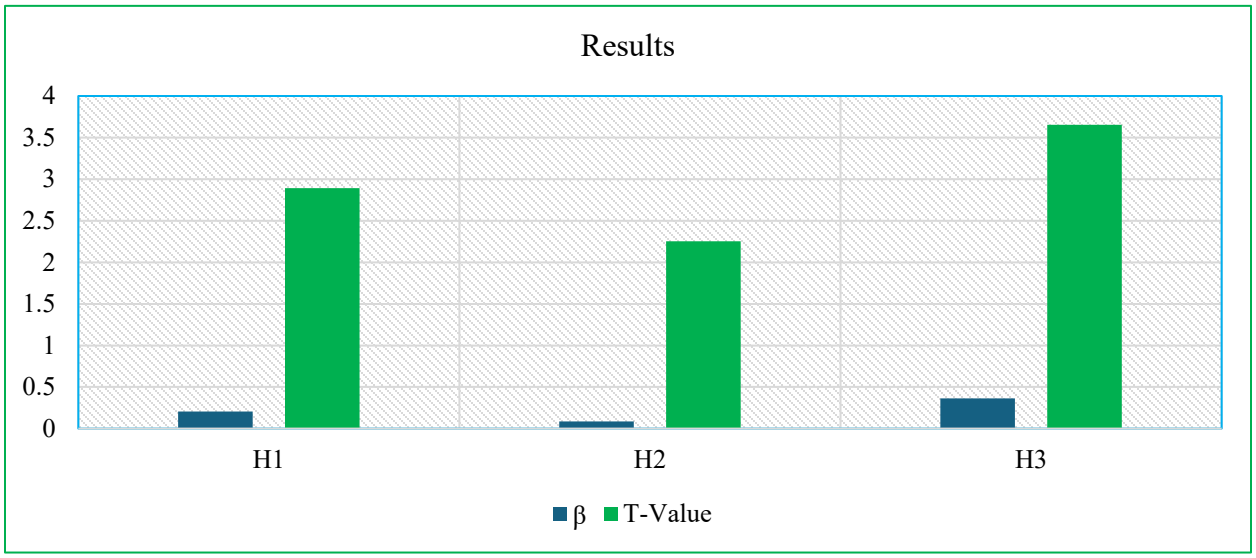

Figure 6: Hypotheses Results.

Discussion and Conclusion

The emphasize on metaverse technology among Pakistani universities is ignored by the practitioners as well as academicians. To fill this gap, this study is one of the steps to introduce metaverse technology among English as Second Language (ESL) learners to improve education related to business model design. To achieve the objective, this study considered the role of video education, video recording and students language acquisition and proficiency in business model design. Therefore, this study examined the relationship between metaverse video education, metaverse video recording, students' language acquisition and proficiency and metaverse business model design.

To address this relationship, three hypotheses were proposed. Hypothesis 1 examined the effect of metaverse video education on metaverse business model design. It is found that metaverse video education has positive effect on business model design. Previous studies also highlighted the important relationship between video education and metaverse (Masferrer, Sánchez, & Hernández, 2014; Nevelsteen, 2018). Writing skills can be progressed through metaverse and educational authorities should be aware of recent trends in teaching writing which emphasize the importance of integrating a process approach. Researchers including and specialists are constantly trying to find adequate answers on the efficiency of writing method approach in the teaching of writing which has been overlooked in many writing classrooms (Forbes, 2019; Meihua, 2009). However, researchers were very much concerned with writing by students but ignored the role of metaverse and its implications in writing methodology.

Hypothesis 2 examined the relationship between metaverse video recording and metaverse business model design. It is found that metaverse video recording has a positive effect on metaverse business model design. Language learning varies from one context to another, and writing is part of language learning (Lee, 2005; Tehrani, Barati, & Youhanaee, 2013; Teng & Zhang, 2018) which can be promoted through metaverse technology. Consequently, the conclusions derived from previous well-known researchers or other writing scholars found that same methodology of metaverse may not be applicable in Pakistan. Thus, new methodology related to metaverse should be implemented among the universities. For example, the context of EFL learners who learn to write in English in the United States is undoubtedly very resourceful. There, everyone uses English and is therefore helpful to their learning. However, those who learn to write in English in a non-English speaking country like Pakistan will not have this privilege (Graham & Shabir, 2019; Haidar, 2019). They may need exceptional attention from the part of writing educators contrasted to those who are more privileged. Hence, it is very important to introduce metaverse video recording among Pakistani universities. Finally, hypothesis 3 highlighted the positive effect of language acquisition and proficiency in

metaverse business model design. Therefore, the increase in language acquisition and proficiency can increase the metaverse business model design.

Study Recommendations

This study recommended to use the metaverse video education and metaverse video recording to enhance student language acquisition and proficiency. Both the metaverse video education and metaverse video recording should be used to promote learning of students related to metaverse business model design. Because findings identified the positive contribution of metaverse to business model design through video education, video recording and student language acquisition and proficiency. The delivery of lectures through video education and video recording can increase the student's language acquisition and proficiency. Therefore, this study has key importance for academicians to enhance language skills among the students. Furthermore, this study recommended the future studies to examine the effect of new metaverse technology in the promotion of student writing performance. Additionally, the metaverse applications in classrooms should be examined in relation to the students performance.

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CRediT Authorship Contribution Statement

Shazma Razzaq: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing.

Declaration of Competing Interest

I state that there are no pertinent financial or non-financial interests associated with this research.

Funding

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Ethical Statement

The author confirms compliance with ethical principles, with no approval required due to the absence of biological or tissue samples

Data Availability Statement

The author can provide the datasets used in this research upon a reasonable request.

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