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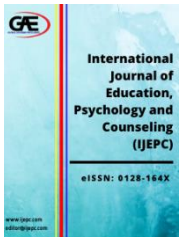

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VIRTUAL REALITY IN MALAYSIAN ENGLISH AS A SECOND LANGUAGE LEARNING: A SYSTEMATIC REVIEW AND IMPLICATIONS FOR PRACTICE AND RESEARCH

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Abstract:

Virtual Reality (VR) technology was crucial in aiding remote teaching and learning session during the Covid-19 pandemic. Transitioning to the post pandemic era, VR technologies are deemed as a useful tool to facilitate learning. Several literature reviews have analysed and synthesized the use of VR in education; however, academic activity lacks a recent systematic literature review (SLR) on VR in the field of English as a Second Language Learning (ESL) in the context of Malaysian ESL learning. 13 scholarly manuscripts from 12 journals were retrieved from the year 2011 to 2021, analysed, and synthesized under the following focus: (a) VR technology utilized, the duration of educational activities, and the language learning settings in the Malaysian ESL context; (b) the possible benefits and drawbacks of adopting VR as a teaching tool in the Malaysian ESL classroom; (c) future directions regarding the educational use of VR. The study concluded that VR technologies encourage English language learning; intrinsically motivate pupils to learn; provide convenience for feedback and communication; practicality; and creates an enjoyable authentic classroom environment. However, challenges like lacks of technical support for practitioners; limited internet access; limited application designated for language learning; participants' unfamiliarity with VR; outdated software and/or hardware; and dearth number of research papers were also identified in this study. It is suggested that in the future, bigger-scale research on main language skills should be done; further research on VR technologies available; increase

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duration of study; research in other areas and levels of schools, and initiate more experimental studies.

Keywords:

Virtual Reality, English as a Second Language, Malaysian Classroom, Virtual Learning, Virtual Environment, Augmented Reality, Systematic Literature Review

Introduction and Objectives

In the year 2020, the outbreak of the novel coronavirus (Covid-19) has been declared as a global pandemic which forced all sectors in Malaysia - except the essentials to shut down indefinitely. Academic institutions were not excluded which resulted in an abrupt halt of any educational activities. Throughout the pandemic, educational practitioners explored numerous online methods of teaching (Dhawan, 2020). Teachers realised that virtual teaching and learning sessions conducted during the pandemic displayed both positive and negative impacts on pupils' learning experience (Curelaru, Curelaru, & Cristea, 2022; Graeske & Sjöberg, 2021). Transitioning to the post-pandemic era, VR technologies are still deemed as a proponent of learning (Akuratiya, & Meddage, 2020); teachers and researchers continue to delve into the potential of virtual reality technology.

Virtual Reality (VR) technology is considered one of the recent technologies that educators view as having high potential to be incorporated throughout the different disciplines of study. Ahmet and Cavas (2020) posit that the superiority of VR technology as a teaching aid surpasses all the classical teaching aids as it can offer an immersive experience that is enjoyable and memorable for users (Shen, Chen, Raffe & Leong, 2021). Despite that, educators remain reluctant incorporating technologies; such as VR, into their teaching and learning process (Tallvid, 2016). Johnson, Jacovina, Russell, and Soto's (2016) book suggested that educators' reluctances derived from factors which were internal (belief and attitudes, skill and technological knowledge, and negative attitude towards technology) and external (training, resources, and support). This SLR could provide deeper understanding for teachers and researchers about VR and its benefits or limitations for teaching and learning session.

From the emergence of VR technology up till recently, academicians and educators had published several research papers that exhibit VR technology as a supporting element to the teaching and learning process. For instance, VR was determined to improve pupils' motivation (Yaacob, Zaludin, Aziz, Ahmad, Othman & Fakhruddin, 2019; Yunus, Lau, Khair, & Yusof, 2020); thus, inciting pupils' excitement and comfort in English as a second language (ESL) learning. In addition to that, a few studies demonstrated that VR brought a significant increase in ESL learning skills. Findings have shown that VR has a positive impact on reading comprehension (Yunus, Yaacob, & Suliman, 2020; Samat, Ghaffar, Manickam, & Yunus, 2019), writing, vocabulary, and punctuation skills (Yuk, Wui-Xin, Qin & Yunus, 2019; Mohammad, Ghazali, & Hashim, 2019), listening skills (Dolgunsöz, Yildirim, & Yildirim, 2018; Jamrus & Razali, 2019), and speaking skills (Damio & Ibrahim, 2019). After considering the potential of VR in ESL learning, the researchers decided to delve deeper into this topic through an SLR. Despite all the benefits VR has for language skills, there is still an insufficiency of research in the field of language education (Alizadeh, 2019), specifically English Language in the context of Malaysian ESL teaching. Therefore, to gain better insights

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into the development of VR in Malaysian ESL learning, this SLR focused on the context of Malaysian ESL learning.

This Systematic Literature Review (SLR) attempts to review research from the year 2011-2021 in the field of English Language learning in Malaysian ESL teaching, it aims to map research findings that are recent and to catalyse further inquiry for addressing current research challenges. Additionally, this SLR could also provide insights on the usage of VR technologies for post-pandemic learning. The objectives of this research are threefold. Firstly, it maps the VR technology utilisation, methodologies, as well as the duration of educational activities and the language learning settings in the Malaysian ESL context; determines the possible benefits and drawbacks of adopting VR as a teaching tool in the Malaysian ESL classroom; and recommends potential directions for the use of VR in education based on the literature reviewed.

Methods

This section presents the preferred workflow of the systematic review and a review of the application and implications of VR technology in Malaysian ESL for learning practice and research. For this research purpose, articles were sourced electronically via an online search engine (Google Scholar) from the year 2011 to 2021. The manuscripts were sourced within the specified timeframe (10 years) to ensure the findings and developments are relevant and updated.

GS was used as a search engine because it provides a larger picture of the academic world by bringing out a large number of previously unseen sources (López-Cózar, Orduna-Malea, & Martín-Martín, 2018, June 18). Additionally, they also underlined that (a) GS's size is three times larger of Web of Science Core Collection (WoScc) and Scopus; (b) GS covers vast coverage of sources from which it feeds: large commercial publishers (Springer, Elsevier), big databases, including bibliographic information systems (ADS, Pubmed), additional scholarly search engines (Citeseer, Semantic Scholar, etc…), social platforms (Academia.edu, ResearchGate), subject repositories (arXiv.org), in addition to Google's book platform (Google Books); and (c) GS's growth rate for indexed documents is fast. Norris, Oppenheim, and Rowland (2008) added that GS performed the best as an open-access search engine because of its capability in finding more than three-quarters of open-access publications when compared to other search engines such as OAIster and OpenDOAR.

The process of doing this SLR started in September 2021 and ended in August 2022 – 12 months; refer to **Table 1.** for the timeline summary of the SLR process.

Table 1: Timeline for SLR Process

	Sep. 21	Oct. 21	Nov. 21	Dec. 21	Jan. 22	Feb. 22	Mar. 22	Apr. 22	May 22	June 22	July 22	Aug. 22
Formulate the Problem												
Develop and Validate the Methods												
Search the Literature												
Screen for Inclusion												

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Assess Quality	
Extracting Data	
Analysing and Synthesising Data	
Report Findings	

On September 2021, researchers discussed and formulated the research questions in the context of Malaysian ESL to avoid them becoming too broad (Cronin, Ryan, & Coughlan, 2008); subsequently, researchers also developed and validated the review protocol to minimise the likelihood of bias in selecting and analysing the data (Kitchenham & Charters, 2007); as well as, ensuring all elements of an SLR are present in the study (Gates 2002; Gomersall, Spencer, Basarir, Tsuchiya, Clegg, Sutton, & Dickinson, 2015) and is on the right track (Kitchenham & Charters, 2007).

A 3-months arduous phase of the study was sourcing for the literatures via GS and simultaneously screening for acceptable manuscripts. Researchers had to instigate 264 different keywords and analyse 1099 results while applying the inclusion and exclusion criteria. An extra month was reserved for the screening process to read the shortlisted 17 manuscripts before deciding that 4 of them are not suitable.

2 months were spent among researchers to discuss and assess the 13 manuscripts whether they are manuscripts of good quality or otherwise. The item could not be analysed if they are not coded appropriately (Stock, Benito, & Lasa, 1996); therefore, the researcher spent another 2 months extracting the data of the accepted papers based on 14 aspects (see **Table 4.**).

Researchers spent 3 months respectively analysing and synthesising data and reporting the findings. From April 2022 till June 2022, data extracted were organized into Microsoft Excel and analysed to find an appropriate way to present the findings. Next, the findings are then worded to present unexpected and new findings (Okoli, 2015); and highlight future directions and opportunities (Okoli, 2015; Rowley & Slack, 2004). Additionally, the process and findings were summarised in a PRISMA flowchart (see **Figure 1.**). The finished draft was also reviewed by all researchers involved for checks and balances (Andrews and Harlen, 2006).

The keywords used to source the appropriate articles include ‘Virtual Reality’, ‘English as a second language learning’, and ‘Malaysian classroom’. **Figure 1**. Summarizes the workflow which is in line with the standard PRISMA flowchart for the SLR.

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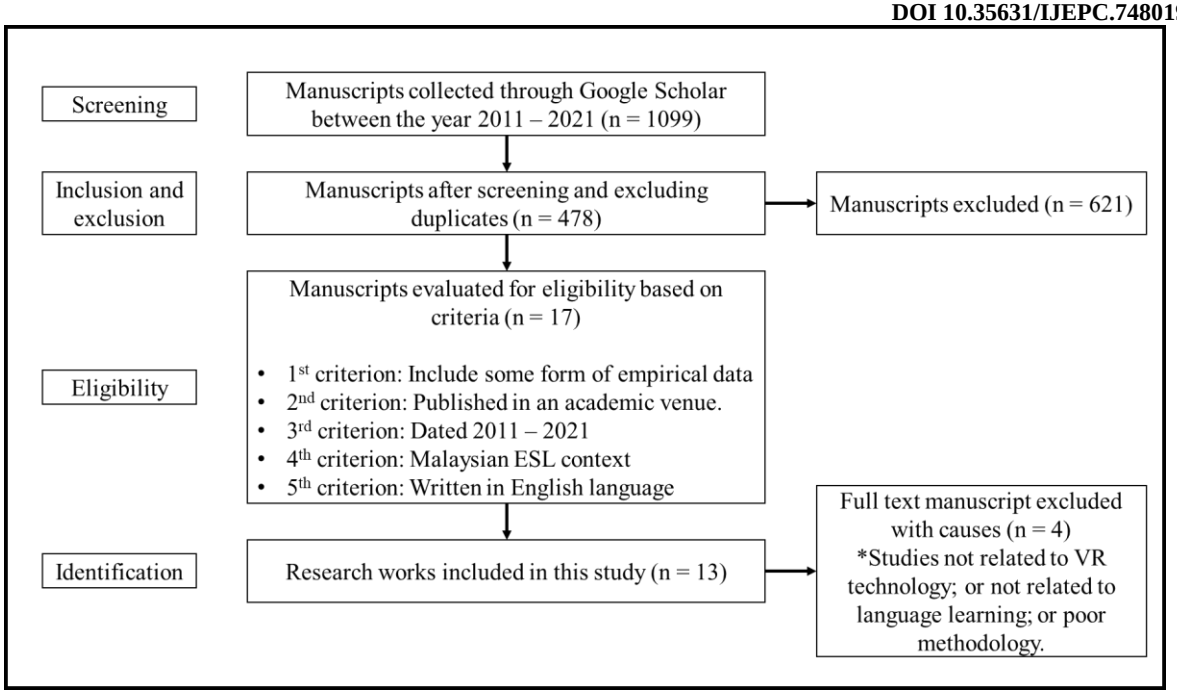

Figure 1: PRISMA Flowcard

Screening

Relevant manuscripts were sourced from the year 2011 – 2021 (10 years) and compiled into a *VR Corpus* as intend to understand the scholarly activity of VR technology in Malaysian ESL learning. The search made in GS yielded 1098 articles.

Search Terms

Manuscripts were sourced manually through keywords search in the publications' abstract, title, and given keywords. The keywords were grouped into three categories related to ('Virtual Reality') AND ('English as a second language learning') AND ('Malaysian classroom') refer **table 2.**

Table 2: Related Keywords

Keyword	Related Keywords
Virtual Reality	("**Virtual Reality**" OR "**VR**" OR "**Virtual Reality Technology**" OR "**VR Technology**" OR "**Virtual Reality Environment**" OR "**Virtual Environment**" OR "**VR Environment**" OR "**Virtual Classroom**" OR "**Virtual Class**" OR "**Augmented Reality**" OR "**AR**") 11 *keywords*
English as a second language learning	**("English as A Second Language"** OR **"ESL"** OR **"English as A Second Language Learning"** OR **"ESL Learning")** *4 keywords*
Malaysian classroom	**("Malaysian classroom"** OR **"Malaysian primary classroom"** OR **"Malaysian secondary classroom"** OR **"Malaysian school"** OR **"Malaysian primary school"** OR **"Malaysian secondary school")** *6 keywords*

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Search Results

A total of 264 searches of keywords were instigated and 1099 total manuscripts were collected. 621 manuscripts were identified as duplicates; thus omitted from the collection of manuscripts. The remaining 478 manuscripts were further screened using the inclusion and exclusion criteria; which identified 17 eligible manuscripts. Upon further reading of the 17 manuscripts, it was concluded that 4 papers were excluded because the studies were either not related to VR technology; or not related to language learning; or had poor methodology. Subsequently, only 13 publications were accepted that complied with all the prerequisites. Refer **table 3**.

Table 3: Number of Papers Identified from Each Journal

Journal	Number of papers accepted
1. ***International Journal of Education, Islamic Studies and Social Sciences Research***	1
2. ***Indonesian Journal of Applied Linguistics***	1
3. ***Practitioner Research***	1
4. ***Creative Education***	1
5. ***PERTANIKA Journal Social Sciences & Humanities***	1
6. ***Universal Journal of Educational Research***	2
7. ***International Journal of Innovative Research and Creative Technology***	1
8. ***Jurnal Kinabalu***	1
9. ***Asian Journal of University Education***	1
10. ***Humanities & Social Sciences Reviews***	1
11. ***Arab World English Journal***	1
12. ***International Journal of English Language and Literature Studies***	1
Total	**13**

Applying Inclusion And Exclusion Criteria

Publications were eligible to be included in the *VR Corpus* if they conformed to these criteria:

(1) Has some form of empirical data in the manuscript.
(2) Published in an academic journal.
(3) Manuscript is dated from the year 2011 to 2021.
(4) Study was done in the Malaysian ESL context.
(5) Publications were written in the English language.

The researcher will not include literature reviews, systematic literature review papers, or product review papers for these types of studies that lack empirical data. Additionally, papers published in proceedings and conferences were also not accepted because researchers were unsure whether peer-to-peer review occurred before papers were published.

Screening And Retrieving Information

After careful screening of each manuscript, information is then extracted and categorised into four categories. These strategies were adapted from Spolaôr & Benitti (2017), and the information extracted (IE) was presented in **table 4**.

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Table 4: Four Categories for Screening and Retrieving Information

Group 1. Publication identification	**Group 2. Activities reported in the publication**
IE 1. Manuscript's title	IE 8. Duration of VR activities
IE 2. Manuscript's ID	IE 9. Type of VR used
IE 3. Year published	IE 10. Knowledge area/subject taught via VR
IE 4. Name of author	IE 11. Skills taught via VR
IE 5. Researchers' educational institution	
IE 6. Research objective	
IE 7. Source of publication	
Group 3. Educational basis of the publication	**Group 4. Discussions and evaluations in publication.**
IE 12. Learning theory used	IE 14. Major findings
IE 13. Justification for utilizing the learning theory	IE 15. Future direction

Source: Spolaôr and Benitti (2017)

Synthesising Data

Data based on the information extracted (IE) in selected journals (refer **appendix**) were retrieved and qualitatively synthesized under the items in **table 3**. The analysis of *the VR Corpus* revealed some essential insights that refer to the research objectives.

Findings

Use of VR Technology

In the *VR Corpus*, the types of VR technologies used by researchers vary. There were four research studies (4/13 manuscripts) that utilized online social network platforms as a tool for ESL learning; the breakdown of the social network platform included two research studies that used Facebook (2/13 manuscripts) and two research studies that used WhatsApp group (2/13 manuscripts). Adapting the use of social networks as a tool for teaching can positively impact pupils' learning performance as it promotes active social interaction among the learners Al-Hasan (2021). Other studies employed the usage of typically encountered VR technologies; which were Augmented Reality (AR) (3/13 manuscripts); VR technology that required the usage of a head-mounted device (HMD) (1/13 manuscripts); non-immersive VR technology in a form of virtual learning environment (3/13 manuscripts). In addition, two manuscripts (2/13 manuscripts) from Azar and Tan (2020), and Tze Pheng, Hashim, and Ainil Sulaiman (2021) studied participants' perceptions of various ICT tools. Azar and Tan (2020) collected participants' perceptions of using Mobile Assisted Learning Language applications (MALL), gamification and VR; whereas, Tze Pheng et al. (2020) investigate participants' experience with ICT tools (Padlet, Frog-Virtual Learning Environment or Frog-VLE for short, Google Docs, and/or social media platforms) during English language teaching and learning session.

At this juncture, there is an obligation to clarify the different definitions of VR. VR often connotates to a virtual experience that only uses HMD. However, according to Georgiev, Georgieva, Gong, Nanjappan, and Georgiev (2021), there are five different forms of VR. A non-immersive VR is the most common type of VR where the experience is achieved via desktops, laptops, tablets, and smartphones in the form of a computer-simulated environment. In other words, users are aware that they are in the 'real world'. On the other hand, a fully

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immersive VR is a type of VR that completely immerse the user into the virtual world with the aid of HMD. Next, an AR is a type of reality that lets pupils experience superimposed images of computer-generated visual stimuli onto the real world. Mixed reality (MR) is a form of AR in which interaction between the virtual elements and real elements are possible; therefore, giving the user control over both virtual and real objects. Finally, extended reality (XR) is a general word that refers to AR, VR, and MR as well as the ones that have yet to be developed. From the types of VR technology being used in the *VR Corpus*, the most utilized form of VR technology is the non-immersive VR technology (8/13 manuscripts) as opposed to fully immersive VR (2/13 manuscripts) and AR (3/13 manuscripts). More studies are needed to be done on the use of fully immersive VR as it provides a richer learning experience.

Language Learning Setting

Similarly, the language learning setting in the *VR Corpus* exhibited variety. The majority of the setting was in secondary school (7/13 manuscripts) whereas, studies done in primary school setting have six research papers (6/13 manuscripts) in the *VR Corpus*. Another standpoint that could be analysed is based on the research participants. Most of the participants were Malaysian ESL school students (10/13 manuscripts); one study participants were Malaysian ESL school teachers (1/13 manuscripts); and one manuscript participants were university interns that taught secondary Malaysian ESL school students. Interestingly, only one study by Tze Pheng et al. (2020) included both pupils and teachers as participants.

From another perspective, the language learning setting could also be analysed based on the schools' area. According to the collection of manuscripts, several researched papers that included participants from urban schools are equivalent to the number of researched papers that included participants from suburban schools, both have five published papers respectively. Rural schools were least researched with only one out of thirteen manuscripts identified. Additionally, a single study by Yunus, Yen, Khair, and Yusof (2020), did their study at two suburban schools and one rural school. One manuscript did not disclose the schools' area; the researchers only stated that the research was done in three different schools with computer laboratories.

The use of VR in Malaysian ESL learning encompassed different schools' levels and areas; however, only two studies were done which recruited teachers as participants, and one study was done with university interns as participants. More studies should include teachers and university students (public universities, private universities, and teacher training institutes) teaching in Malaysian ESL schools as participants. Moreover, studies needed to be done in primary schools, secondary schools, and higher institutions as well as schools situated in rural, urban, and suburban areas to expand the shareable knowledge to academia.

Duration of the Educational VR Activities

According to the *VR Corpus*, two studies (2/13 manuscripts) did their research for a period equal to or more than 10 weeks. The longest duration among these two studies was three months; while, the duration for the second paper was ten weeks. Several studies (5/13 manuscripts) did their research for a duration of lower than 8 weeks. The ascending order of the duration is 7 weeks and 4 days; 4 weeks; 2 weeks with 23 hours engagement; 1 day; and 5 sessions with 30 minutes engagement for every session.

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Difficulties in determining the exact duration of research encountered when analysing Action Research (2/13 manuscripts), the only sense of duration could be observed based on the number of cycles administered; whereby, the first paper did a 2-cycle Action Research and the second paper did 1-cycle Action Research. One paper identified to only generally state the duration which was done in 2 phases. Unfortunately, three manuscripts did not explicitly state the duration.

Investigated Skills

The majority of the skills investigated in the collection of manuscripts targeted at developing basic communication skills (9/13 manuscripts), this could be caused by the research participants where most of them were primary and secondary students (10/13 manuscripts). In the *VR Corpus*, writing skills (5/13 manuscripts) and vocabulary (3/13 manuscripts) were the most investigated skill; while reading skills (2/13 manuscripts) and speaking skills (1/13 manuscripts) were both the least researched skills. Unfortunately, none of the manuscripts studied listening skills specifically, but some (3/13 manuscripts) of the studies required participants to listen to instruction, which helped pupils indirectly enhance their listening skills. As an example, research by Fong & Por (2020); Chandran, Plaindaren, Pavadai, and Yunus (2019); and Ibhar, May, and Yunus, (2018) all required participants to use their listening skills in understanding instructions and teachings. There were also studies (2/13 manuscripts) identified from the *VR Corpus* that focused on other than the four main language skills. Halili, Nurul, and Rafiza (2018) compared pupils' engagement in traditional learning and using Frog-virtual learning environment (Frog-VLE) when learning English Literature; moreover, Azar and Tan (2020) decided to contextually understand participants' perception of using ICT techs (MALL, Gamification, VR) in teaching the English language. Azar and Tan (2020) took a general approach by not specifying any specific skill they were studying.

Benefits and Limitations of VR as An Educational Tool in Malaysian ESL Classroom

Using VR as an educational tool in the Malaysian ESL classroom comes with advantages and disadvantages. VR technology played an important role during and post-pandemic. Yet, teachers and academicians must be aware of the limitations and drawbacks of VR for effective teaching and learning session during post-pandemic.

All of the manuscripts in the *VR Corpus* exhibited participants' improvement in their English language. Other than that, a recurring point mentioned in most of the manuscripts (8/13 manuscripts) is VR technology's potential to intrinsically motivate pupils. According to the *VR Corpus*, utilizing VR technology in the classroom can aid in the manifestation of intrinsic motivation among participants. Intrinsic motivation is a type of motivation that exists out of real enjoyment and interest that comes from within (Donald, Bradshaw, Ryan, Basarkod, Ciarrochi, Duineveld, Guo & Sahdra, 2020). **Table 5**. presents a summary of the benefits and drawbacks of VR identified in the *VR Corpus*.

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Table 5: Summary of Benefits and Drawbacks of VR

Type of VR	Benefits	Drawbacks
Non-Immersive VR [8] *	• Encourage improvement in writing performance. • Encourage improvement in vocabulary learning. • Encourage improvement in reading comprehension. • Increases behavioural, cognitive, emotional, and agentic engagement. • Helps language learning regardless of user's anxiety level. • Creates a fun learning environment. • Increases motivation in learning English language. • Practicality. • Encourages discussion (cognitive constructivism) • Immediate feedback (social constructivism theory)	• Lacks of technical support hinder teachers from using VR technology. • Little to no improvement in terms of grammar learning. • Poor internet accessibility. • Outdated software and/or hardware performance in catering VR technology. • An inferiority complex existed between two groups of participants from different states.
Immersive VR [2] *	• Creates a fun and enjoyable environment. • Can contribute to effective second language acquisition. • Presents a more authentic learning environment. • Encourage vocabulary learning. • Practicality	• Limited application designated for language learning. • Teachers are required to provide guidance when using VR to ensure effective English learning.
Augmented Reality [3] *	• Teachers have a high level of readiness in using AR to teach English reading. • Enhance vocabulary acquisition. • Pleasant feeling and positive attitude towards AR. • Effective in maintaining motivation and engagement.	

**Number of manuscripts*

Future Direction

A summary of suggestions for research in the future based on the panorama of the literature on VR for ESL learning in the Malaysian context is provided below:

(a) *Bigger-scale research:* Researchers stressed the need to execute larger-scale studies with bigger samples to investigate the reliability of the findings (Annamalai, Tan, &

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Abdullah, 2016); additionally, Yunus, Yaacob and Suliman (2020) suggested more research and development to be done in different context. Similarly, Suhaimi, Mohomad and Yamat (2019) proposed in their study to conduct research with bigger samples that include different races.

(b) *Further research on VR technology:* VR technology has potential in aiding English learning; therefore, deeper research needed to be done to identify the capabilities of VR. Azar and Tan (2020) suggested for a further analysis and experiments for VR technology. They intended to look into MALL and how it can achieve blended learning. Suhaimi and Mohamad (2019) also in agreement since they proposed on exploring other features of WhatsApp to be used for language learning. Similarly, Tze Pheng et al. (2021) recommended further exploration on the use of technology in teaching writing in the ESL classroom. Different social media platforms should also be explored for ESL learning (Suhaimi et al., 2019).

(c) *Duration of research:* In the *VR Corpus*, the duration of studies varies. Briefly, only 9 studies specified a timeframe for their research and there were only two papers that did their research for a duration of more than 10 weeks. Suhaimi et al. (2019) expressed that a longer duration of time should be done to increase validity and reliability. Yaacob et al. (2020) also suggested that more longitudinal research could help in enhancing language learning.

(d) *Research on other areas of schools:* Chandran et al. (2019); Suhaimi et al. (2019) and Jamrus and Razali (2021) called for further study to other areas of schools such as in the rural areas where social media is not accessible and urban areas.

(e) *Research on main language skills:* Realizing the positive impacts VR has in Malaysian ESL classrooms, researchers suggested adopting as well as researching the use of VR on different ESL skills (Yunus et al., 2020; and Suhaimi et al., 2019).

(f) *Experimental studies:* In the *VR Corpus*, the method of study that was adopted were action research (3/13 manuscripts); case study (3/13 manuscripts); perception study (3/13 manuscripts); mixed method (1/13 manuscripts); descriptive study (1/13 manuscripts); quasi-experimental study (1/13 manuscripts) and quantitative study (1/13 manuscripts). To further increase the validity and reliability of the findings, more experimental studies should be done (Halili et al., 2018)

Conclusion

Based on the findings, it is concluded that VR technology plays a significant role in Malaysian ESL learning. In terms of ESL skills, VR was able to help with language acquisition and encourages improvements in terms of writing performance, vocabulary learning, and reading comprehension. Behaviourally, VR affects maintaining pupils' motivation, emotional engagement, and agentic engagement because VR could incite a fun and enjoyable authentic environment; consequently, aiding pupils with different anxiety levels learn. Additionally, VR was also cited as practical, encouraging discussion, and able to provide immediate feedback. As VR technologies continue to grow, their potential is promising in improving English language learning and acting as a tool for remote learning post-pandemic. Teachers should take advantage of and implement VR technologies into teaching instructions.

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Appendix

IE 1	IE 2	IE 3	IE 4	IE 5	IE 6	IE 7	IE 8	IE 9	IE 10	IE 11	IE 14	IE 15
Teaching Narrative Writing About Bully: The Use of WhatsApp on Primary School Pupils	1	2019	Suhaimi, N. D., & Mohamad, M.	8 pupils from an outskirt (Suburb) year 6 primary school in Negeri Sembilan, Malaysia. The participants were 4 girls and 4 boys achieved A2 CEFR level.	To identify the effects of WhatsApp in teaching narrative writing to Year 6 primary school pupils in the aspect of content (topic of writing is bully).	International Journal of Education, Islamic Studies and Social Sciences Research	4 weeks, 4 phases	WhatsApp	English writing	Narrative Writing	50% improved by a few points, and 50% of pupils experienced one/two points deficit on their post-test. WhatsApp encourage discussion. Provides immediate feedback. Learn beyond classroom. Encourage participate in learning. Internalized the issue that was discussed and helped them to understand their role in the issue. Helped in writing task.	Increase pupils' engagement in learning English writing as the integration of mobile messaging apps, WhatsApp could suit their 21st century learning. Explore other features of WhatsApp like audio recording, status and stickers.
Traditional Versus Virtual Learning: How Engaged Are the Students in Learning English Literature?	2	2018	Halili, S. H., Nurul, H., & Rafiza, A. R.	80 students aged 13-17 from an urban government secondary school in Kuala Lumpur. 40 students use FROG-VLE and 40 students uses traditional method. Same level according to their streaming and examination results.	To compare the students' engagement activities in traditional learning and the VLE for the English literature subject	Indonesian Journal of Applied Linguistics	Done in two phases.	FROG-VLE	English Literature	Engagement in learning English Literature	Pupils' engagement using FROG-VLE was higher than learning in traditional method. Their behavioural, cognitive, emotional and agentic engagement were all higher. The highest engagement activity was following rules in EL class (behavioural engagement).	Modify the study by making it a more experimental study, by providing the respondent with pre and post-test.
Augmented Reality (AR) Flashcards as A Tool to Improve Rural Low Ability Students' Vocabulary	3	2020	Yaacob, A., Zaludin, F., Aziz, N., Ahmad, N., Othman, N. A., & Fakhruddin, R. A. M.	10 Year 1 low ability students of a rural school in Jeli.	To examine the effectiveness of using Augmented Reality (AR) flashcards on low ability rural students' vocabulary.	Practitioner Research	A single cycle action research method was adopted.	AR flashcards	English Vocabulary	Vocabulary acquisition	All 10 students' vocabulary scores improved. AR flashcard were effective in maintaining high level of motivation and engagement among the students.	More longitudinal research on vocabulary retention among ESL primary learners using Augmented Reality is needed to enhance their vocabulary learning.
Teaching Presence in An Online Collaborative Learning Environment Via Facebook	4	2016	Annamalai, N., Tan, K. E., & Abdullah, A.	6 students from an urban Chinese Girls' school, Penang.	To explore the interactions of the teacher and students in an online collaborative learning environment.	Pertanika Journal Social Sciences & Humanities	10 weeks	Facebook Group	English Writing	Narrative Writing	COI model were all present in the interactions. The interactions related to the teaching presence encouraged students to improve their narrative writing. Other descriptors also exist such as code-switching, exam centredness and teacher-centeredness. Interaction in online collaborative learning is a good practice to encourage narrative writing.	More studies should be conducted with bigger samples to investigate the robustness of the findings.
Collaborative Writing: An Integration of Snack Bars and Hi-Five Fingers Via social media	5	2019	Chandran, Y., Plaindaren, C. J., Pavadai, S., & Yunus, M. M.	55 secondary four pupils from SMK Tasek Utara, Johor Bahru, Johor and SMK Abdul Rahman, Kuantan, Pahang. (Urban schools)	To help the secondary four pupils use the hi-five Fingers and Snack Bars via social media (Powtoon and Facebook) in their writing to achieve better results.	Creative Education	3 months	Facebook	English writing	Writing essay	Improvement in pupils' grades in their writing performance after using the hi-five fingers and bars via social media. Creates fun learning environment. Able to motivate students. Lastly, able to do the activity anywhere and anytime. Internet accessibility is poor	Further research about collaborative writing can be carried out in rural schools with no access of social media.
The Application of ICT Techs (Mobile-Assisted Language Learning Gamification and Virtual Reality) In Teaching English for Secondary School Students in Malaysia During Covid-19 Pandemic	6	2020	Azar, A. S., & Tan, N. H. I.	63 participants of University Interns teaching at an urban secondary school.	to contextually understand the university interns' perception of ICT techs in teaching English for secondary school students during COVID-19 Pandemic in Malaysia and to determine which of the ICT Techs would be most preferred by the interns for teaching English to secondary school students in Malaysia.	Universal Journal of Educational Research	n/a	MALL, Gamification and VR	English Language	Engagement in learning English Language	Interns believed in the importance of gamification in teaching ESL to secondary school students during the pandemic. It creates a fun and enjoyable environment. MALL can contribute to effective second language acquisition. Presents a more real-life learning environment for students during MCO period.	Consider all the aspects before choosing the right game in teaching ESL. Study how MALL can achieve blended learning among secondary students. Further analysis and experiments for VR technology.
ESL Students' Perceptions Towards VR 360 Learning Application to Enhance Vocabulary Learning	7	2018	Ibhar, M. Z., May, L. M., & Yunus, M. M	30 lower secondary school students in Kuala Lumpur, Malaysia whereby 20 of them were males and 10 were females. (Urban)	To explore ESL students' perceptions towards the use of VR 360 learning application for English vocabulary learning enhancement among lower secondary school students in Kuala Lumpur, Malaysia.	International Journal of Innovative Research and Creative Technology	1 day	VR 360	English Vocabulary	Vocabulary Learning Enhancement	Students had positive views towards the use of VR 360 learning app for English vocabulary learning enhancement. Authentic learning environment, understand and memorize better on the vocabulary usage with VR. Teacher can encourage "everywhere and anywhere" vocabulary learning. Teacher needs to provide guidance when using VR in order to ensure effective English learning.	n/a
Acquisition Of Vocabulary in Primary Schools Via GoPIC with or Code	8	2020	Yunus, M. M., Yen, E. L. Y., Khair, A. H. M., & Yusof, N. M.	64 low proficient primary school students. 58 year 1 students from Selangor and 6 Year 5 students from Sabah. (2 Suburban schools & 1 Rural school)	To investigate the importance of improving students' language experiences in their acquisition of vocabulary.	International Journal of English Language and Literature Studies	2 cycled AR	Augmented Reality (QR Code)	English Vocabulary	Vocabulary acquisition	Respondents' vocabulary performance was better during the post-test. Pupils experienced pleasant feeling and positive attitude. Receive immediate feedback without feeling intimidated. Focus in learning.	n/a
Effects Of a Pronunciation Learning Management System Among Students of Different Language Anxiety Levels	9	2016	Fong, S. F., & Por, F. P.	329 primary five Malaysian students from different schools. (Area n/a)	To investigate the effects of three presentation modes of 'epronounce' in learning correct pronunciation with phonetic symbols among non-native English speakers with different language anxiety levels.	Jurnal Kinabalu	5 sessions with 30 minutes each	Virtual classroom	English pronunciation	text, sound, phonetic symbols, mouth movement and face gesture	There were no significant interaction effects between language anxiety levels and presentation modes of 'epronounce'. Seemingly, 'epronounce' is able to bring the students to medium language anxiety level and 'epronounce' can help students regardless of their anxiety level.	n/a
The Use of Electronic Frog VLE In Assisting Reading Comprehension Activities	10	2020	Yunus, M. M., Yaacob, N., & Suliman, A.	30-year 5 Primary ESL pupils (15 male and 15 female) from a sub urban school in Hulu Langat, Selangor.	To identify the year 5 primary ESL pupils' perception of electronic Frog VLE in assisting reading comprehension activities.	Universal Journal of Educational Research	n/a	FROG-VLE	Reading	Reading comprehension	Respondents enjoyed completing the five types of reading comprehension activities using FROG-VLE and benefited from them. Respondents were optimistic with the hardest task when doing it in FROG-VLE. Remain positive in implementing reading comprehension activities through electronic FROG-VLE. Poor internet connection disrupts reading activities; Forgets password and ID; Low computer performance	More research and development needed to be conducted in a different context of learning. Study to be conducted towards different ESL skills.
Acceptance, Readiness and Intention in Use Augmented Reality (AR) In Teaching English Reading Among Secondary School Teachers in Malaysia	11	2021	Jamrus, M. H. M., & Razali, A. B.	181 Malaysian English language teachers, Klang Valley, Malaysia (Suburb)	Reports on Malaysian English Language teachers' readiness and acceptance in using Augmented Reality (AR) in English instruction and their intention to use AR in teaching English reading	Asian Journal of University Education	n/a	Augmented Reality (AR)	Reading	Reading	High level of acceptance in using AR in the teaching of English reading. High level of readiness to use AR in the teaching of English reading.	to conduct the research in several locations, such as in the rural areas and find out about the teachers' and students' level acceptance and readiness in using AR in teaching and learning English reading.
The Effects of WhatsApp in Teaching Narrative Writing: A Case Study	12	2019	Suhaimi, N. D., Mohamad, M. & Yamat, H.	8 pupils (4 male and 4 female) from a primary school located in Negeri Sembilan, Malaysia. They were 12 years old and all are Malays (Suburb)	To identify the effects of WhatsApp in teaching narrative writing to Grade 6 of primary school pupils in the aspect of vocabulary and grammar	Humanities & Social Sciences Reviews	2 weeks with 23 hours engagement.	WhatsApp	Writing	Narrative Writing	Post test revealed that the vocabulary aspect has significantly improved as 75% of the participants showed increase of one and two marks while the aspect of grammar was not found to have any effect as only one participant who represented 12% of the participants showed slight improvement from 12 marks to 13 marks.	The study could be extended into different. Take bigger samples of different races. Initiate the study with longer duration. Try with other language skill; use other social media apps.
The Use of Technology in Teaching of Writing Among Malaysian ESL Secondary School Teachers	13	2021	Tze Pheng, K., Hashim, H., & Ainil Sulaiman, N.	40 ESL Secondary school pupils in Peninsular Malaysia (34 female English teachers and 6 male English teachers with various teaching experience, less than 5 and to more than 10 years of teaching experience) (Suburb)	To investigate the teaching of writing practices and technology tools employed by English as a second language teachers when teaching writing skills.	Arab World English Journal	53 days	Various ICT tools	Writing	Writing	Technology is an important tool to improve students' writing skills, assist teachers as a teaching aid and promote students' engagement in classroom. However, lacks of technical support hinders some teachers from using technology because it takes a lot of time which disrupts the teaching and learning process.	Further explore the use of technology in teaching writing in an ESL classroom. This is to help students improve their writing skills and encourage more teachers to make full use of technology in the classroom.