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Beyond Physical Realm: Unveiling English Language Educators' Acceptance and Readiness for Virtual Reality Integration

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Abstract

Virtual reality (VR) as one of the metaverse is viewed as a novel approach in teaching and learning of the English language in the Malaysian education landscape. However, due to its novelty and controversial issues (cyber sickness, deviation from learning, time-constraint, cost-constraint), a debate has ensued as to whether VR is effective and practical to be incorporated in primary ESL education. Moreover, there is an apparent dearth of research on teachers' perceptions of VR in ESL classrooms. Hence, this study aims to determine ESL teachers' acceptance and readiness to use virtual reality in teaching and learning. Cross-sectional survey design was employed with the incorporation of UTAUT and TAM models as conceptual framework. Through a purposive sampling method, 189 English primary school teachers from Kuching district in Sarawak responded to an online questionnaire. The descriptive analysis of the collected data unveiled a moderate inclination towards acceptance and readiness to integrate VR into ESL classrooms. Although the respondents displayed the highest levels of performance expectancy and effort expectancy, there was a notable deficiency in the facilitating conditions, indicating a significant barrier in this crucial aspect. This study provides the Ministry of Education (MOE) with a nuanced understanding of teachers' levels of acceptance and readiness to integrate VR into the ESL classroom setting. Future research should center on gauging teachers' acceptance and readiness following practical implementation of VR-based instructions within the ESL classroom.

Keywords: Virtual Reality (VR), Virtual World, Teachers' Acceptance, Teachers' Readiness, English as a Second Language (ESL), English as a Foreign Language (EFL)

Introduction

The world transformation into a digital abode due to the proliferation of digital technologies is promising a brighter future in various fields. The emergence of the fourth industrial revolution (IR 4.0) has catalyzed the advancement of technology (Teo et al., 2021) in the world of metaverse, robotics and quantum computing (Hameed & Hashim, 2022). As a developing

country, Malaysia is not exempted from the revolutionary transformation of digital technology (Rafiq et al., 2019). The meteoric growth of the metaverse world consisting of artificial intelligence (AI), augmented reality (AR) and virtual reality (VR) is bringing a whole new scenery in the education sector (Zhang et al., 2022). In comparison to artificial intelligence and augmented reality, virtual reality is considered still really new in the education field, especially in the teaching and learning of ESL. Guo and Lan (2023) define virtual reality as a 360-degree virtual environment with highly realistic 3D virtual scenes that users explore with their visual and auditory senses. The realism of VR in teaching and learning has attracted the interest and curiosity of both educators and learners (Huang et al., 2023). Chen (2022) contended that the novelty and high immersion level in VR elevate learners' motivation in learning, contributing to the effectiveness of teaching and learning.

Despite the exceptional benefits that VR can offer to the education landscape, it has yet to secure a stance in the education sector as it is regarded as novel in the world of education, especially in the field of English as a Second Language (Shamsudin & Yunus, 2022). Consequently, a debate has ensued as to whether VR is effective and practical to be used as one of the approaches in ESL education, especially in the primary school context. Some educators raised their concerns that VR may cause the students to be addicted to playing in the virtual world that they deviated from learning (Chu et al. 2023). Apart from that, learners may suffer from cybersickness : emotion sickness or discomfort experienced by users from an exposure in the immersive virtual world (Porcino et al., 2022; Sagnier et al., 2019, Saredakis, et al., 2020). Additionally, a lot of time is needed to be able to effectively utilize VR in the lesson (Bower et al., 2020), which makes it too time-consuming and not practical in the classroom. The poor condition of school facilities and resources also may also cause educators to hesitate to integrate VR in their educational practice (Shen et al., 2019). These controversial issues surrounding VR may demotivate teachers in utilizing VR in their teaching and learning of the English language.

Due to the concerns about the practicality and effectiveness of VR in the education field, researchers had conducted studies attempting to measure the users' acceptance of virtual reality integration in the classroom. Unified Theory of Acceptance and Use of Technology (UTAUT) model by Venkatesh (2003) and Technology Acceptance Model (TAM) by Davis (1989) were particularly ubiquitous in those studies due to their robustness and simplicity (Kaushik & Verma, 2019). While UTAUT is a successful model that examines the acceptance of innovative technology (Asghar et al., 2021), TAM is one of the most highly relevant and suitable models to assess users' readiness in using new technology (Alamaiah et al., 2022). UTAUT and TAM have also been employed in other research that attempted to look into users' acceptance and intention to use certain technology (Lie & Yunus, 2019; Chun & Yunus, 2023; Assaker, 2020).

However, there is an apparent lack of research on teachers' perceptions on the use of VR in ESL classrooms. Most of the studies only focused on either the effectiveness of VR or learners' perceptions of VR (Liu et al., 2023; Chen et al., 2022; Tai et al., 2022) and only a handful of research looked into the teachers' perceptions (Jang et al., 2021). Relevant insights from their perspective of view are paramount for the stakeholders and policy makers to draft a plan for the development of facilities and training programs (Alalwan et al. 2022). Hence, there is a dire need to investigate primary school teachers' perceptions to use virtual reality

as one of the teaching methods in the teaching and learning of the English language. Therefore, with the integration of UTAUT and TAM models, this study aims to determine Malaysian teachers' acceptance and readiness to use virtual reality in ESL teaching and learning. This study centered around two research objectives :

1. To investigate the level of acceptance of ESL primary school teachers in using VR in educational practices.
2. To examine ESL primary school teachers' level of readiness to use VR in English language teaching and learning.

Literature Review

Unified Theory of Acceptance and Use of Technology for Teacher's Acceptance

The Unified Theory of Acceptance and Use of Technology (UTAUT) was developed by Venkatesh et al. (2003), aiming to measure users' level of acceptance in the use of innovative technology (Asghar et al. 2021). Venkatesh et al. (2012) then extended the UTAUT into UTAUT-2 where they incorporated three more constructs in their theory; hedonic motivation, price value and habit in consumer context. Recent extension of UTAUT3 was introduced by Farooq et al. (2017) whereby they integrated the construct of personal innovativeness (PI) in the theory. UTAUT was developed to assess the use of innovative technology within organizations, while UTAUT2 was developed for consumer context (Li et al., 2023). Since this study mainly focuses on primary school teachers' acceptance rather than in consumer context, UTAUT is more appropriate for this research.

Venkatesh et al. (2003) have theorized that the four significant roles as direct determinants of users' technology acceptance and usage behaviour are performance expectancy (PE), effort expectancy (EE), social influence (SI), and facilitating conditions (FI). Performance expectancy refers to how beneficial the technology is in helping the users improve their work performance (Venkatesh et al., 2003). It is drawn from the theory in perceived usefulness, extrinsic motivation, comparative advantage and result expectancy of the new technology (Yunus et al., 2021). In this research, PE is referred to as the extent to which teachers expect that using virtual reality in teaching English will help them improve their performance and achieve their goals. The next predictor, effort expectancy: the degree of ease in using the technology (Venkatesh et al., 2003) is referred to as teachers' perceived expectation of the ease or complexity when using virtual reality in the ESL classroom in this study.

On the other hand, social influence is defined as the degree to which an individual perceives that people important to them believe they should use the new system (Venkatesh et al., 2003). This present study refers to SI as the perceived influence from important people around the teachers that might affect their decision to use VR as one of their teaching tools. Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system (Venkatesh et al., 2003). Teachers' perceptions of the resource's availability as well as technical support and assistance in the school that will make sure teaching ESL using virtual reality is smooth and effective is referred to as the FC for the context of this study. In conclusion, UTAUT can provide a comprehensive lens that establishes a solid foundation for technology adoption and acceptance in the realm of ESL teaching and learning.

Technology Acceptance Model for Teacher's Readiness

Davis (1989) developed the Technology Acceptance Model (TAM) to measure users' acceptance or readiness of new technology. Despite the development of various models to assess new technology readiness, TAM is still the most influential model. It has become the threshold of technology readiness that users need to cross before it can be integrated into practices (Geng et al., 2019). According to (Rosli et al. 2022), there were 945 papers published on TAM in Scopus database in 2019, and it dramatically increased threefold to 2764 articles in 2022, insinuating its increasing popularity. Davis (1989) introduced five paramount variables in TAM: perceived usefulness (PU), perceived ease of use (PEOU), attitude toward use (ATU), behavioural intention (BI), and actual use (AU). Among the variables mentioned, PU and PEOU are the two core determinants to predict technology readiness and users' attitudes (Ng & Yunus, 2021; Kunz et al., 2020). This study incorporated PU, PEOU and ATU to address the educators' readiness for VR in the teaching and learning of the English language.

PU is used to measure whether an information system is useful or not while PEOU assesses the difficulty of using the technology (Du & Gao, 2022). PU in this study refers to how much the educators think that the technology is beneficial to them and whether it contributes to their teaching performance. On the other hand, this research refers to PEOU as the teachers' perceptions of how much effort it takes for them to utilize and manoeuvre VR in teaching English. Apart from that, Davis (1989) posited that the user's attitude which is the overall impression of the technology was a pivotal predictor of whether the new technology would be accepted or rejected (AL-Oudat & Altamimi, 2022). Users' PU and PEOU which determine their attitude towards use affects the outcome variables which are intention to use and actual use (Alfadda & Mahdi, 2021). Thus, the educators' overall perceptions toward the use of VR in ESL education affect their intention to use VR in their educational practices. The PU, PEOU and ATU in TAM facilitate a deeper understanding of the factors influencing educators' readiness to use VR in their educational practices, giving an insight into the transformation of technologies in the language education realm.

Virtual Reality for Teaching and Learning

Over the years, as virtual reality is building its reputation in the education world, various studies on users' perceptions have been conducted to determine their acceptance in using VR in the education landscape. Most of the studies attempted to determine either the users' acceptance or readiness as well teachers' intention to use by incorporating UTAUT or TAM model.

VR acceptance through the lens of UTAUT has been discussed in both lower and higher education, though the focus on VR in primary and secondary schools is not as highlighted as in universities and colleges. In lower education, Al Breiki et al. (2023) in their study investigated the relationship between social and personal factors and behavioural intention of 171 public school teachers to use virtual reality in Science education. The results of their study that attitude, perceived behavioural control and social norms can predict the intention to use virtual reality, whereby attitude is determined as the strongest predictor. Boel et al. (2023) in their study revealed that secondary school teachers' personal willingness has more influence on their decision to utilize VR in contrast to social norms. It was also revealed that PE, SI, FC, hedonic motivation and personal innovativeness have significant influence on their intention to use VR. Most of the studies done on VR acceptance are conducted in the higher

education landscape either in universities, colleges or vocational schools. This is probably due to the fact that higher education has more well-equipped facilities and financial resources as opposed to primary and secondary schools. Ustun et al. (2020) investigated the acceptance and VR usage of 421 medical students in a university. It was unveiled that the students have a high acceptance of VR integration and are most likely to use VR tools in learning anatomy. Similarly, Shen et al. (2019) attempted to investigate the direct determinants that affected 376 university students' intention to use HMD in IVR learning. It was discovered that PE, EE, SI, FC and CE were the direct predictors of students' intention to use HMDs in their learning. Facilitating conditions for instance support from authorities and sufficient HMD resources with readily available infrastructures were deemed vital in ensuring that users will have higher acceptance and intention to use VR in learning. Contradicting Shen et al., (2019), Spangenberger et al. (2023) unveiled in his study that only performance expectancy significantly predicted the intention to use IVR in the classroom. They aimed to provide insights into how 55 vocational teachers perceive the value of immersive virtual reality and the extent to which their beliefs can serve as predictors for their future intention to use it. As observed by Estrada et al. (2022), the attitude towards VR usage exhibits a positive trend. They reported a favourable reception of VR (Virtual Campus) among college educators, emphasizing its potential in enhancing the educational experience.

Technology Acceptance Model (TAM) has been widely used as a model to measure technology acceptance. However, it could also be used interchangeably for the construct of readiness in the use of technology (Mousa et al. 2020; Almaiah et al. 2022; Qader et al. 2022). It should be noted that in this study, TAM is used to measure technology readiness, but in a lot of other studies, it is also used to measure acceptance towards certain technologies. Some education fields involved in the studies are Science education, Geography education and English education. A study was conducted by Hite et al. (2017) to investigate how 3D HE VR enhances EOU and influences pre-service and in-service Science teachers' technology acceptance. Their findings suggest that when the PEOU is addressed, the potential for technology acceptance among in-service teachers is enhanced. Raja and Priya (2020) conducted a study on factors that affected the teachers' intention to use virtual reality in the classrooms with 92 teachers teaching six different subjects. They posited that though educators show a good level of readiness to use VR tools in the classroom, teachers teaching different subjects showed different degrees of interest in VR. Another study by Jang et al. (2021) conducted a study aiming to explore elementary school teachers' willingness to incorporate AR and VR technologies for teaching and learning. They investigated whether social norms, TPACK and motivational support affect teachers' intention to use VR. The results of the study elucidated that TPACK had the biggest significant influence on teachers' PU and PEOU. Similarly, Ko and Shin (2023) incorporated another four influencing factors (TPACK, self-efficacy, constructivist beliefs, motivational support) along with TAM to investigate their effect on the acceptance of AR and VR technology. The survey results unveiled that self-efficacy and motivational support affected PEOU. Geng et al. (2019) also investigated secondary school teachers' perceptions of VR, particularly in geography lessons. They discovered a high perceived usefulness (PU) of VR, with teachers recognizing virtual field trips as a potent tool for enhancing students' motivation. In a study done by Sprenger & Schwaninger (2021), they attempted to compare users' perceptions of four different digital learning technologies; mobile virtual reality (MVR), classroom chat, classroom response system and online lecture in a period time of three months. Interestingly, users demonstrated

the lowest level of acceptance towards MVR as compared to the other digital technologies. The failure of the MVR was attributed to the amount of time it took for the setup of the mobile VR sequences and technical issues that negatively impacted their PEOU of the MVR.

While these studies provide valuable insights into teachers' acceptance and readiness to use VR in various educational contexts, there is a noticeable gap in the literature regarding its specific application in English language teaching. Barrett et al. (2021) touched on this by exploring VR's use in learning to write English paragraphs, emphasizing the importance of PU in influencing learners' intentions to use VR. However, their focus was primarily on learners rather than teachers. While existing studies have explored teachers' perceptions in subjects like science and geography, and learner perspectives in English language learning, the intersection of English language teachers' readiness and acceptance of VR technology remains underexplored. Not only there is a lack of research on teachers' perceptions and acceptance, there also seems to be an absence of studies on Malaysian ESL primary school teachers' acceptance and readiness to use VR. Thus, this existing gap becomes a strong motive for the execution of this research.

Research Methodology

Research Design

The research employed a quantitative approach using survey design in order to determine ESL primary school teachers' acceptance and readiness to use virtual reality. Cross-sectional survey design was employed to explain the ESL primary school teachers' level of acceptance and readiness to use VR in the classroom. Two conceptual frameworks were used in this study, in which the first framework for the construct of acceptance was adapted from UTAUT model by Venkatesh (2003). Meanwhile, the second framework for readiness construct was adapted from TAM by Davis (1989).

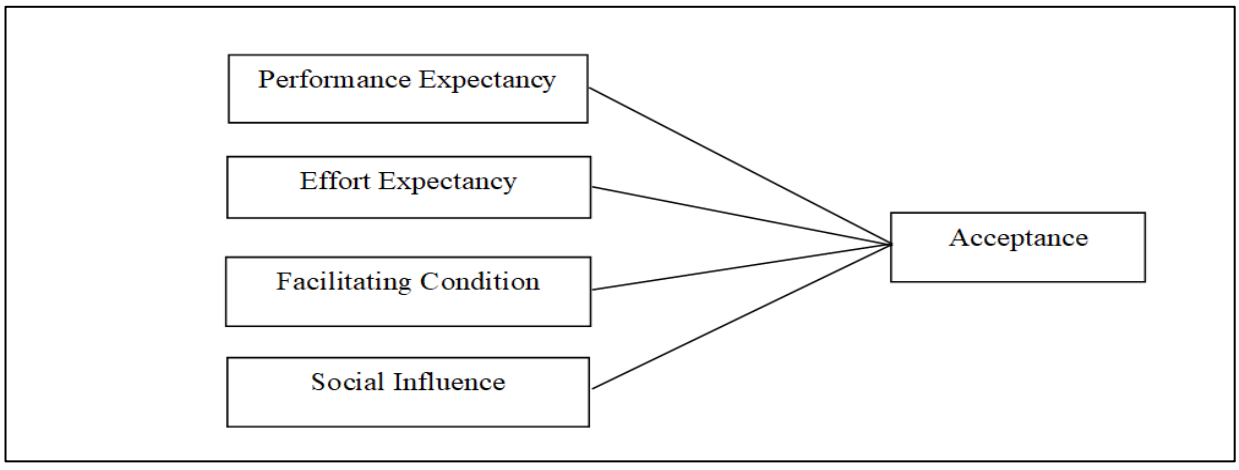

Figure 1 Conceptual Framework for Acceptance adapted from Venkatesh (2003)

The conceptual framework for the construct of acceptance includes the variables of Performance Expectancy, Effort Expectancy, Facilitating Condition, and Social Influence. These variables were examined to determine ESL primary school teachers' acceptance level of VR integration in the classroom.

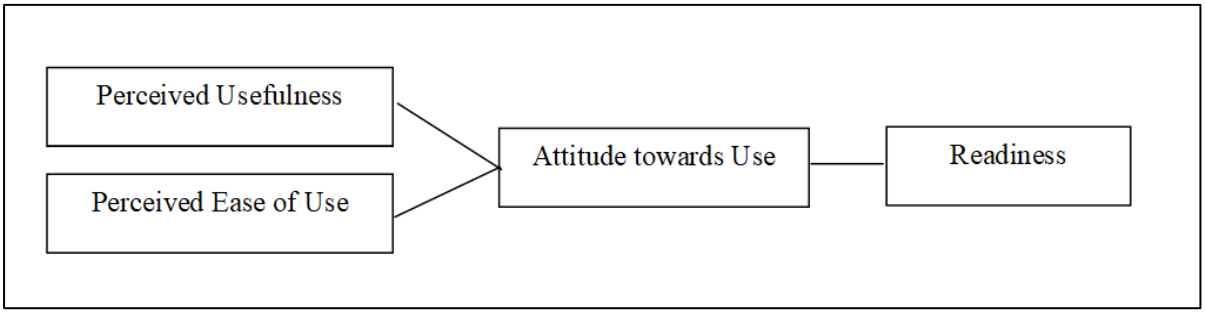

Figure 2 Conceptual Framework for Readiness adapted from Davis (1989)

On the other hand, the construct of readiness includes the variables of Perceived Usefulness, Perceived Ease of Use and Attitude towards Use. The teachers' readiness level to use VR was examined using these three variables. Although both models are acceptance models, they differ in terms of organizational and individual factors. Incorporating only TAM as the acceptance model is not sufficient as it only focuses on individual factors such as PU and PEOU (Davis, 1989). On the other hand, UTAUT involves acceptance at the organizational level where SI and FC become an important predictor of users' technology acceptance level (Venkatesh, 2003). Hence, integrating both UTAUT and TAM in this study gives a deeper and more nuanced understanding about the teachers' acceptance and readiness to use virtual reality in the ESL education landscape.

Research Sample

Through a purposive sampling method, 189 English primary school teachers from Kuching district, a primarily urban district in Sarawak, responded to an online questionnaire. The respondents were mostly from two generational groups : Millennials (27 to 42 years old) and Gen X (43-58 years old).

Data Instrument

A cross-sectional survey method was employed for data collection. The questionnaire utilized in this survey was adapted from Jamrus and Razali (2021) and Chun and Yunus (2023). The survey was in a form of Google Form questionnaire comprised four sections; Section A : demographic background (5 items), Section B : knowledge and understanding about virtual reality (4 items), Section C : teacher's acceptance (12 items), and Section D : teacher's readiness (9 items), totaling 30 items. A 4-point Likert scale was employed for Section B, ranging from strongly disagree, disagree, agree to strongly agree. Meanwhile, a 5-point Likert scale was used for Sections C and D, spanning from strongly disagree, disagree, neutral, agree to strongly agree. The neutral scale was omitted in Section B to ensure respondents did not choose a neutral option, as the presence of neutral scale would make it challenging to assess their knowledge of virtual reality. However, the neutral scale was included in Sections C and D to accommodate respondents without prior knowledge of VR, allowing them to choose neutral if they were uncertain about the items.

Validity is referred to as "the degree to which all of the evidence points to the intended interpretation of test scores for the proposed purpose" (Creswell, 2012). To ensure the items in this questionnaire have a high degree of validity, the questionnaire was evaluated by three panels with expertise in the ESL field: School Improvement Specialist Coaches Plus (SISC+)

with 19 years of experience; head of the English panel in a primary school in Beluran; Senior Assistant with a Masters in TESL. Their comments were considered before editing the questionnaire and sending it out to the respondents.

Reliability refers to stability of the measured values gained in repeated measurements under the same conditions using the exact instrument Sürücü and Maslakçi (2020). Field (2013) argued that Cronbach's α values of 0.70 or greater are deemed acceptable in measuring the overall reliability of a set of items. A run on Cronbach's Alpha demonstrated that all of the subscales in this questionnaire pointed to a high degree of reliability with acceptable internal consistency ranging from α = 0.79 to α = 0.93.

Data Collection Procedures

In the initial process of collecting data, permission to carry out research was first obtained from eRAS 2.0 (Educational Research Application System 2.0). Since the researchers were from different districts and it would be difficult to be there physically in the research setting, cooperation from Kuching State Education Department (JPN Kuching) and Kuching District Education Department (PPD Kuching) was requested. Therefore, they were the gatekeepers : people at the site of the authors' research who may hold either official or unofficial roles to assist the researchers in accessing the research setting and samples (Creswell 2012). An officer from PPD Kuching aided the researchers by distributing the Google Form (GF) link to all of the Senior Assistants from all the primary schools in Kuching to be sent to all English primary school teachers in Kuching district. ESL primary school teachers from rural areas were not included to ensure the homogeneity of the samples. Due to time-constraint, only one week was given for the primary school teachers to fill in the GF questionnaire and a total of 189 teachers had filled in the questionnaires during that time frame.

Data Analysis

The data obtained was analysed using SPSS version 26. Descriptive analysis was used to determine Kuching ESL primary school teachers' acceptance and readiness to use virtual reality. Frequency, mean, standard deviation and interpretation of mean was calculated for descriptive analysis. The mean values for items Section C and D which employed 5 Likert-scale were interpreted in reference to Oxford (1990) whereby the summated mean scores are interpreted as such : 1.00 - 2.339 (low), 2.34 - 3.669 (moderate) and 3.67 - 5.00 (high). The interpretation of mean is illustrated in Table 1.

Table 1
Interpretation of Mean for Section C and D

Mean Value	Interpretation of Mean
1.00 - 2.339	Low
2.34 - 3.669	Moderate
3.67 - 5.00	High

Findings

The findings provide an overall view of teachers' acceptance and readiness to use virtual reality in teaching and learning. A descriptive analysis of the mean and standard deviation for each construct will be explained to offer a better understanding of teachers' level of acceptance and readiness of VR utilization in the ESL classroom.

ESL Primary School Teachers' Acceptance Level of VR Integration in Educational Practices

The findings of this study unveiled a moderate level of acceptance among ESL primary school teachers in the integration of VR in the educational practices. Table 2 presents the descriptive analysis of teachers' acceptance in using VR which includes the constructs of Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Condition (FC). The mean, standard deviation and interpretation of mean are also displayed in the table to better understand the data gained from the questionnaire.

Table 2
Descriptive analysis of teachers' acceptance in using VR

Constructs	Mean	SD	Interpretation
Performance Expectancy	3.84	0.635	High
Effort Expectancy	3.69	0.715	High
Social Influence	3.31	0.680	Moderate
Facilitating Condition	2.57	0.889	Moderate
Overall Acceptance	3.35	0.549	Moderate

The findings in Table 2 demonstrate the mean values for all variables ranging from moderate to high ($\bar{X}$ = 2.57 to 3.84). Besides that, the value of standard deviations of the variables spanned from σ = 0.549 (overall acceptance) to σ = 0.889 (FC). This points out that data points in FC are more spread out around the mean as compared to the data point in other variables. In comparison to FC, the data points in overall acceptance were mostly clustered around the mean value. In regards to the mean values, PE reported the highest mean value ($\bar{X}$ = 3.84, σ = 0.635) with FC reporting the lowest value of mean ($\bar{X}$ = 2.57, σ = 0.889). The high value of mean for PE suggests that the respondents have a high expectation that using VR will improve their work performance in the teaching and learning of the English language, hence positively impacting their acceptance level. On the contrary, the low value of mean for FC which is more inclined to the low interpretation of mean value ($\bar{X}$ = 2.339) may indicate that the respondents believe that the facilities provided in their schools such as technology equipments, resources and specialised helps are not adequate for them to implement VR in the classroom. Thus, this may have a negative impact on their acceptance to use VR. Meanwhile, the value of mean for EE is also high ($\bar{X}$ = 3.84, σ = 0.635), indicating that the respondents believe that using and learning VR does not require too much effort, which positively influences their acceptance level. SI documented mean values of $\bar{X}$ = 3.31, = 0.680 which elucidated that the influence of people around them has an impact on their decision to accept VR. Lastly, the value of mean for overall acceptance is $\bar{X}$ = 3.35, proposing that the respondents have a moderate level of acceptance to use VR in their teaching and learning, in

relation to their PE, EE, SI and FC. However, the FI construct which shows the least positive response among the respondents should be paid more attention to in order to ensure a smooth transition for the incorporation of VR in the educational practices.

ESL Primary School Teachers' Level of Readiness to Use VR in English Language Teaching and Learning

The findings have revealed that the respondents have slightly higher readiness level than acceptance level, though both are still interpreted as moderate. Table 3 shows the descriptive analysis which includes the mean, standard deviation and interpretation of mean from the data obtained for teachers' readiness in using VR in ESL teaching and learning. Three variables were included in the construct of readiness, which are Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and Attitude toward Use (ATU).

Table 3
Descriptive analysis of teachers' readiness in using VR

Variable	Mean	SD	Interpretation
Perceived Usefulness	3.66	0.628	Moderate
Perceived Ease of Use	3.50	0.639	Moderate
Attitude toward Use	3.60	0.651	Moderate
Overall Readiness	3.59	0.597	Moderate

Based on table 3, the values of mean range from X^{-} = 3.50 to 3.66, pointing out to a relatively moderate and similar level among variables. The standard deviation values also extend from σ = 0.597 to 0.628 pointing out that all data points are clustered around the mean and are consistent and homogenous. The highest value of mean can be seen in PU (X^{-} = 3.66, σ = 0.628), which even though is considered moderate, it should be noted that it is only 0.01 score away to high interpretation of mean value (X^{-} = 3.67) . This suggests that the respondents perceive VR as a tool and an application that could be very useful in the teaching and learning of the English language, which contributed to an increased level of readiness to use VR. The respondents' PEOU (X^{-} = 3.50, σ = 0.639) also positively affects their readiness level in which they believe that VR is easy to use. For ATU which is their attitude towards use, the mean value is X^{-} = 3.60, σ = 0.651, interpreted as moderate though close to the mean value for high interpretation. This implies that the respondents have a quite positive attitude towards the use of VR as a tool to teach the English language, which has a positive impact on their readiness to implement VR. Respondents' positive perceptions of PU, PEOU and positive ATU in the integration of VR in the ESL classrooms lead to a moderate level of readiness amongst them. As a conclusion, the descriptive analysis points to a positive attitude towards the use of VR in ESL teaching and learning, indicating that they are quite ready to utilize VR in the classroom. However, the PEOU variable has the lowest mean amongst the three variables, suggesting that the respondents might expect using the VR to be easy, but there will be some challenges and difficulties along the way.

Discussions

This study examined the acceptance and readiness level of English primary school teachers for virtual reality integration in teaching and learning in Malaysian context. As per the researchers' knowledge, this is the first study in Malaysia that utilizes a substantial sample size (more than 100 respondents) with the aim to assess English primary school teachers' acceptance and readiness level for VR integration in the classroom settings. Most of the other studies tended to center on students' acceptance and readiness level while overlooking teachers' perceptions.

ESL Primary School Teachers' Acceptance Level to Use VR in Educational Practices

There are four predictors included in the Acceptance construct, namely Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Facilitating Condition (FC). Each variable will be discussed as the predictors of teachers' level of acceptance in using VR in ESL teaching and learning.

Firstly, for Performance Expectancy, the results of this study proposes that the ESL teachers in Kuching have a high expectation that their teaching and learning performance will be improved with the use of VR. The teachers perceive VR as a learning tool that can be useful to facilitate their teaching by encouraging participation and instilling learners' motivation in the ESL classroom. This result is supported by Shen et al. (2019), in which he claimed that by using VR, learners may enhance their learning effectiveness. Both studies by Liu et al. (2023) and Yu et al. (2020) also reported increasing proficiency level in students' reading and speaking performance respectively. The effectiveness of VR in teaching and learning may be attributed to its novelty factor and high immersion level that can improve learners' focus and motivation in the classroom (Chen & Hwang, 2022).

In terms of Effort Expectancy, this study has revealed that the teachers have a highly positive perception of the amount of effort required to handle and manoeuvre VR technology. They believe that learning and using VR does not demand too much effort and is in fact feasible in the classroom setting. For instance, utilizing NVR in the classroom does not differ much from using normal applications for lessons as only a flat computer screen and a mouse or keyboard are required by the users (Pleyers & Poncin, 2020). The only difference is NVR is much more immersive than the traditional website applications used by educators and learners (Yu et al., 2020). If they already have a good command of the conventional media, it will definitely be much easier for them to navigate the VR devices, therefore increasing their PEOU. Pletz & Zinn (2018) also claimed that users in their study that had more experience in technology had significantly higher PEOU in contrast to those who had less experience. Additionally, some of the features in VR such as the downloadable feature can ease the progress in VR lessons as the teachers and students do not have to worry about the connection problem (Alizadeh, 2019).

In contrast with the previously mentioned variables, the level of acceptance of SI is lower, though still in the moderate level. This result is similar to a study conducted by Bower et al. (2020) in which they claimed that most of the teachers answered neutral to mildly agree for Social Influence, implying that the teachers did not have a strong perception of Social Influence. This is perhaps due to the lack of conversation amongst educators about the use of VR in the English classroom. Since VR is relatively new, it may not be a popular learning tool

yet among their colleagues and the teaching profession workforce. In a similar fashion, Boel et al. (2021) in their study posited that the reasons for the weak perception of SI are because of the fact that VR remains isolated from the mainstream use of digital technology at an organisational level. Hence, the teachers and educators' decisions to implement VR in their ESL classrooms are most likely due to their personal willingness rather than social norms (Boel et al., 2023).

Among all variables, FC has the lowest value of mean which is one of the major concerns as it may impede the incorporation of VR in the teaching and learning of ESL. The majority of teachers expressed a lack of sufficient technological resources for VR implementation in schools. The absence of paramount resources such as impeccable internet connection, availability of VR devices and specialized assistance led to teachers believing that their schools do not have the capacity to integrate VR into everyday lessons (Shen et al., 2019). Additionally, the cost of HMDs which may reach around 600 dollars depending on the level of quality (Kami´nska et al., 2022) might discourage VR implementation especially in the context of Malaysian classrooms with an average number of 30-40 students in a class. However, it came as a surprise that some of the educators claimed that they had attended training, implying that Kuching educational institutions have taken a significant stride towards the initiation of Virtual Reality integration in the educational system. This is probably made possible by the establishment of The Augmented and Virtual Reality Cluster Center in Kuching, Sarawak, the first AR and VR Center in Malaysia (EON Reality, 2019). In fact, there have been many articles on Virtual Reality in Kuching published by credible researchers, albeit the focus is more on tourism (Chin et al., 2023; Badiozaman et al., 2021; Yung et al., 2020). The availability of excellent nearby facilities which can provide resources and training to both educators and learners may facilitate the development and progress of VR in the educational landscape.

Teacher's positive perceptions of Performance Expectancy, Effort Expectancy, Social Influence and Facilitating Condition in Virtual Reality may have led to a moderate acceptance towards the use of VR in the teaching and learning of English as a Second Language. This remarks a positive growth and progress of VR in the usage of VR as educators are embracing and becoming more accepting towards the idea of VR as a teaching and learning tool in the classroom. Li et al. (2023) in their study argued that prospective teachers are becoming more accepting of VR in which they claimed that VR has the potential and ability to reduce teachers' burden and enhance teaching effectiveness. Nonetheless, although VR is slowly attaining its position in the educational field, it cannot be denied that there is still a lower level of acceptance for VR as compared to other prominent digital technologies in the education landscape (Sprenger & Schwaniger, 2021). Controversial issues such as cybersickness (Saredakis et al., 2020), deviation from learning (Tai et al., 2020), time constraint (Bower et al., 2020) and cost constraint (Kami´nska et al., 2022) may be one of the limiting factors of VR integration in educational practices (Sagnier et al., 2019; Chen & Kent, 2020).

ESL Primary School Teachers' Level of Readiness to Use VR in English Language Teaching and Learning

The readiness construct comprised three constructs, which are Perceived Usefulness (PU), Perceived Ease of Use (PEOU) and Attitude towards Use (ATU). The variables will be discussed in relation to teachers' readiness level in VR integration level in the educational practices.

The findings of this study revealed that there is a moderate level of PU among the teachers in the teaching and learning of the English language. However, it is important to note that the mean score is 0.01 shy away from a high level of PU. This suggests that teachers perceive VR as a useful tool to improve their classroom instruction and effectiveness in the teaching and learning of the English language. The impressive feature in VR software such as Eduventure that enables teachers to access their students' learning data and grades is highly beneficial as an assessment tool for the teachers (Wu et al., 2021). Similarly, the automatic speech recognition in VR software like Mondly VR offers both educators and learners immediate feedback of learners' accuracy in pronunciation (Tai & Chen, 2021). VR features that can simultaneously be used to teach and assess students can bring huge benefits to the teachers and therefore, they will have a higher PU of VR..

In terms of Perceived Ease of Use (PEOU), the teachers have a moderate level of PEOU. They believe that using VR to teach the English language may be moderately easy and that the instructions to use VR would be clear and understandable. Even though a considerable number of teachers in this study are from Gen X, most of them are the younger generation within the age range of 43 to 55 years old. Thus, it is not unexpected that they will have a moderate level of PEOU as these generations are not strangers to the use of digital technology. This is supported by a study carried out by Syed-Abdul (2019) where he revealed that even VR users aged 60 to >90 years old have a moderate and high level of PEOU. The flexibility of some VR lessons that can be accessed via mobile devices or tablets may have contributed to the ease of use as these are devices often used in the teaching professions (Wu & Hung, 2022).

There is a predominantly positive attitude among teachers towards the use of VR in the teaching and learning of VR in English lessons. A majority of the teachers claimed that they think implementing VR in the ESL teaching and learning is a good idea and that they might like using VR to teach English. A research by Estrada et al. (2022) posited that the teachers have a really positive attitude towards VR (Virtual Campus) in which almost 90% of them stated that they would recommend VR to be used in teaching and learning. Similarly, Hite et al. (2017) in their research on Science teachers' perceptions of VR as a teaching tool argued that teachers have a positive attitude towards the use of VR as they recognized the potential and benefits of VR pedagogically. Serin (2020) in his study also reported that the vast majority of the teachers have positive attitudes towards VR. The positive ATU may be linked to the usefulness of VR and the ease of learning and using the 3D tool in educational practices.

The teachers' level of readiness to use VR among the primary school teachers is overall moderate, though the value leans slightly more towards high level of readiness. This may be attributed to their encouraging Perceived Usefulness and Perceived Ease of Use of Virtual Reality as well as their positive ATU of VR in the teaching and learning of the English language. This study bears similar results to the study conducted by Raja and Priya (2020) in which they posited that English teachers have a moderate level of readiness to teach English as they believe VR can be useful to teach English and that they can be skillful in using VR.

Conclusions

Through the previous discussion and explanations, this study has achieved its aim which is to determine ESL teachers' acceptance and readiness to use virtual reality in teaching and learning. There is an overall moderate acceptance and readiness level among ESL primary school teachers to integrate VR in their educational practices. Their positive attitude towards VR integration also elucidates their readiness to use VR in the classroom setting. However, there is still some hesitance to use VR due to the inadequate resources and facilities which are indispensable to ensure effective VR utilization. The results of this study have provided profound information that can be used as a leverage for MOE and educational institutions to understand the underlying factors in educators' acceptance and readiness to integrate VR in the ESL education landscape. As such, there must be a corresponding effort by our educational institutions by slowly incorporating VR at organisational level while placing an importance on VR facilities and devices in schools. Apart from that, the policymakers should take the varying degree of acceptance and readiness among the language educators into consideration and develop policies that cater to the different level of acceptance and readiness.

Despite the valuable insights unveiled from this study, it is pivotal to address its limitations. First of all, it should be noted that there is no practical implementation of VR-based instruction in this study due to time and cost constraints. Thus, there may be discrepancies of teachers' perceptions if they are exposed to the utilization of VR in ESL classroom settings in a study setting versus the lack of exposure to VR devices in this study setting. Besides that, this study did not include the construct of teachers' technological knowledge as a predictor of acceptance or readiness level, which may have overlooked the fact that varying levels of technology knowledge might have an impact on their degree of acceptance. In addressing the limitations that have been mentioned, future research should endeavour on incorporating the usage of VR devices in a study setting before the survey to capture their acceptance and readiness level more accurately. Apart from that, teachers' technological knowledge should be included as one of the predictors for their acceptance and readiness level in ensuring a more nuanced understanding of English language educators' perceptions of virtual reality.

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