

# Acceptance and Use of Virtual Reality and Its Impact Towards Learning Attitude Among Young Adults in Shah Alam, Selangor, Malaysia

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## ABSTRACT

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Virtual Reality (VR) technology is a computer simulation system that creates new learning experiences in the virtual world. VR creates a simulation environment that has an impact on learning attitude and this new environment interacts with three-dimensional dynamic views that has an impact physical learning behaviour. Virtual reality is part of an innovation process where the user interacts with real-time simulation and the remarkable advanced technology tools to understand better, on the products. The traditional learning method is monotonous, and the current study is an interactive learning process that saved time, enhanced young people's learning attitudes and gave them the ability to learn anywhere at any time. The study aims to identify virtual reality acceptance and use among young adults and its impact towards learning attitude. Learning attitudes that are measured within this study are excitement and happy feelings when using VR. One of the impactful growths of VR is the use of virtual technology in education institutions where universities and schools are emphasising alternative ways of learning. This confirms the researcher's thoughts that acceptance and use of VR is essential in today's world which focusses on digitalisation technology. A quantitative methodology was applied in this study, where face to face surveys through the distribution of questionnaires was given out to a group of 200 young adults from the Shah Alam community in Selangor, Malaysia. The study shows that Virtual Reality Hedonic Motivation is the highest factor influencing Virtual Learning Behavioural Intention that leads towards acceptance and use (Pearson correlation  $r=.741$  and Regression  $R^2 = .549$ ). Thus, the findings and discussion will be further added to the present literary works and helps future researchers improve learning attitudes towards young adults with the adaptation of VR, specifically in a Malaysian context.

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## 1. INTRODUCTION

Virtual Reality (VR) refers to a simulated experience which is similar to or completely different from the real world. It typically involves the use of computer technology to create a three-dimensional, interactive environment and immersive feel of a virtual world that users are able to explore and interact with (Godovykh et al., 2022). Users experience immersion in a virtual world through the use of a specialised VR headset, which stimulates their senses of sight, hearing, touch and occasionally even smell and taste. VR technology is used in various fields, including entertainment, education, tourism, medical and business. In education, learning is a development that change and improve present knowledge as a result of experience, and it increases the possibility for better performance and future learning. The process of learning requires knowledge, skills and attitude which lead to improving current knowledge and skills (Thammasitboon, 2022). In order to learn, a good communication must be performed for the sender and receiver to understand the subject matter. Learning is taught through various channels such as education in schools, moral values by parents and learning from a role model. Learning through technology is a common method in today's globalisation world. Technology has developed tremendously over the years and the implication of it has increased in every part of life. Once, mobile phones used to be essential for students' lives as numerous applications for information, education and entertainment purposes are all available through Wi-Fi connectivity (Rashid et al., 2020). Now, VR is an example of technology which is used to grow a simulated environment which has been derived from computer technology (Abich et al., 2021). VR places the user or the reality world into a three-dimensional experience, which is also known as 3D world. The top rated quickly recognisable part of the virtual reality is HMD or Head-mounted display (Samadbeik et al., 2018), but in the process of virtual reality, users are immersed to interact with the three-dimensional world, instead of viewing a screen in front of them. Virtual reality is part of the innovation process where the user interacts with real-time simulation and remarkable advanced technology tools to understand better the products or VR used to "travel" to a destination (Atsiz, 2021). According to the World Economic Forum (2017), consumer spending on VR is expected to reach \$200 billion by 2027.

The use of virtual reality technology in educating young adults is not an idea of the present day. The VR topic has been researched and analysed since 1990. The implication of this idea used in the Anglo-Saxon countries . Using VR in training impacts young adults' knowledge retention and motivation while transforming the learning environment (Shamuratov & Alimbaev, 2022) and by doing so this interactive learning creates learning excitement. Nowadays, technology has spread its arms over each and every sector of life and the biggest spectator of the technology is the educational institution (Akman & Çakır, 2020) and medical education (Erolin et al., 2019). A study carried out by Maresky et al., (2018), tested the effectiveness of a VR simulation in medical teaching particularly in the heart area. These researchers show that, VR has the possibilities to improve student engagement and learning outcomes with this alternative learning in the education sector. Over the years, technology has improved tremendously, and costing has reduced. This has resulted in VR being used in various fields and it is an alternative method of learning. VR environments are usually closed to the physical world in the sense that the environment they create is entirely new (Virca et al., 2021). Commercial VR devices are starting to provide sufficient quality and affordability for informative and entertainment use, which make educational VR experiences more widely available in the future (Ni et al., 2022; Shamsudin & Yunus, 2022). Young adult learning facilitated by VR should create student excitement, interactive and engagement.

Currently, learning in Malaysia starts from primary level to Higher Education Institutions (HEI) where the teachers have whole domination of their student, and the student must obey all the

instructions given by them. The creativity part of students exploring new methods of education is not developing as these students are not given the opportunity. HEI in Malaysia seeks to produce graduates who are knowledgeable with critical thinking, decision making and problem-solving skills (Hasnor et al., 2013). According to Lee (2022), university students face many challenges, adapting to online learning instantly. The VR for interactive learning in Malaysian education is a new method and it is developing (Bistaman et al., 2018). The traditional learning method is monotonous (Lui, 2021) and the current study is an interactive learning process that saves time, enhances young people' learning attitudes, and gives them the ability to learn anywhere at any time (Juřík et al., 2021; Kaliyaperumal et al., 2020). Nowadays, the learning methods in HEI are mainly a one-way interaction where educators speak, and the students listen. The fundamentals of cognitive is being applied in VR through interaction with the three-dimensional world and young adults are eager to learn more through the help of the technology and the updated tools (Yan et al., 2019). Learning through technology creates flexible learning infrastructure where students are able to learn and communicate at the same time even their locations vary, and various online learning methods ensure the continuity of information delivery to students (Hanafi & Kamal, 2022). The study aims to identify virtual reality technology acceptance and use among young adults and its impact towards learning attitude.

VR is a combination of advanced image processing, interactive human computer communication and tracking devices where all these combination leads towards experiential medium (Bistaman et al., 2018). To develop the learning attitude using this approach, VR facilities must be provided by HEI. Learning in classroom by adapting to the games is an exciting way of gaining knowledge in encouraging the intellectual, emotional and character development of a young adult (Tyas et al., 2021; Masturoh & Ridlo, 2020). VR creates a comprehensive way to facilitate alternative learning experiences by enhancing self-learning concept and preparing young adults for future value add knowledge. Virtual reality has become more accessible to young adults in university because of online digitalisation and they should be able to use them easily if they are explanation on the using method. In the history of virtual reality education, there are some sorts of transformations of VR such as fully immersive, semi-immersive and non-immersive simulations. At first, virtual reality education was in the non-immersive stages when there were a few students. Then comes the semi-immersive and fully immersive with the progress of technology and the increasing number of students in virtual reality education all over the world (Jean et al., 2021). Virtual reality education opens the probabilities of alternative learning and teaching through a dedicated device. This method is still growing for more advancement so that the students be more engaged with their interactive learning and absorb more information effectively.

In order to identify virtual reality acceptance and use among young adults and its impact towards learning attitude, this study underlines three (3) main objectives: -

- a) To identify VR factors influencing Virtual Learning Behavioural Intention (VLBI)
- b) To identify Virtual Learning Behavioural Intention (VLBI) and its impact towards Virtual Learning Use Behaviour (VLUB)
- c) To study the acceptance and use of Virtual Learning Use Behaviour (VLUB) and its impact towards Learning Attitude (LA)

## **2. LITERATURE REVIEW**

### ***2.1 The Development of Virtual Reality Technology***

Virtual Reality (VR) has emerged as one of the most captivating technological advancements of all time. It offers individuals an immersive and interactive experience that transcends the boundaries of the physical world (Hilken et al., 2021; de Keyser et al., 2019). Over the past few decades, the development of virtual reality has undergone remarkable progress, transforming from a concept rooted in science fiction to a tangible reality. In the twenty-first century, technology upsurge in popularity for the educational area such as mobile learning (m-learning) on smartphones, online teaching through Google Meet and assignment are done through various online platform. VR technologies are being integrated into educational learning programs, especially in dynamic environments, to train student in a structured environment without impacting the wear and tear of expensive simulators (Fussell & Truong, 2021). During year 1990's, the development of VR is expensive and largely because of the huge cost only rich people would be able to take advantage of this technology. Major VR evolutions took place in the 1980s, although its origins go back to Ivan Sutherland's 1965 paper 'The Ultimate Display' (Dodge & Kitchin, 2003). In year 1968, Sutherland created the first computer-aided HMD in with internal sensors that traced the user's head movements. The helmet design combined two miniature monitors placed directly in front of the eyes to create binocular 3D vision and certain features have been updated over the decades to suit different human development as well as imminent sorts of physical and cognitive reliability, impressiveness and eyes tracking technology (Juřík et al., 2021; Mat Zain et al., 2011).

### ***2.2 Virtual Reality as New Media***

VR as a new media is a new concept of digital environment where the user metaphorically steps inside a reality world in exploring interactive media, games, online festival, conferences and enjoying performance (Weijdom, 2022). VR applications is being use in medical training, property management, tourism and town planning environments and this way of communicating provide alternative way of knowledge sharing session (Lamb & Etopio, 2020). Virtual reality improved itself in many stages by providing virtual students with immersive and memorable experiences. VR technologies particularly based on HMD, have the prospective to go beyond boundaries of place and time, providing unlimited opportunities to create any particular content and increase student's attractiveness towards the subject (Juřík et al., 2021). It helps the students in increasing their ability to memorize and due to this reason, it becomes more popular with the students, and they are likely to take the advantage of virtual reality education. The advantage of VR is the power of images use colourful descriptions and videos is clear, so the user has a better understanding. It also increases the enthusiasm for the knowledge in the mind of the learners and this helps in boosting their activity and creativity (Yulie et al., 2021). Lamb & Etopio (2020) conducted a study to evaluate the claim that virtual reality ambiances provided a greater learning attitude on the subject. This shows that if virtual reality technology us being acceptance by young adults thus it would be able to provide benefits for the end user towards their learning attitude.

### ***2.3 Implementing Virtual Reality in Malaysia Education***

Wong et al., (2020) conducted research regarding implementing VR in Malaysia tertiary education in studying the acceptance of implementing this technology. The result shows that 76% students accept level of implementation of virtual reality as a learning media. On the same research, 83% of respondents agreed that VR is capable in helping students to understand better

compares to conventional method. 93% responded positively that VR provide better experience in subject related to experiment and practical subject. VR encourage student to participate actively during learning is also being analysis in this research and the outcome of it was 83% respondents agree to the particular statement. On the same research, 88% of respondents from various university, decided that VR assist students in visualisation and reification difficult content. This research indicates that virtual reality is accepted as a new learning interactive method in Malaysia and adaptation of conventional learning would enhance the young adult's knowledge and have an impact towards their learning attitude. Education is an important part of the life and brings reputation to a country and by having excellent education, it will produce the next generation who are expected to have a compassion like the ideology adopted by a country (Mahanani et al., 2022). Investment in education is expensive based on the belief that the quality of education brings differences careers and achievement for its citizens (Syukri, 2019). Ministry of Education in Malaysia has developed Malaysia Education Blueprint 2013 – 2025 to focus on Malaysian education system where students must be imbued with values, attitude and moral values. In this blueprint, leveraging on digitalisation technology is part of the transformation shift in Malaysia education system. According to Dwivedi et al., (2020), the learning method improved the student's personality attributes. This shows that the findings on learning attitude towards VR technology is vital for the Malaysian policy maker to execute a new strategy on education system.

#### ***2.4 Young Adults Learning Attitude***

Young adulthood between ages of 18 to 25 years old is a crucial development period where these adults are engaging themselves to participate in identity formation and self-exploration (Higley, 2019). The young adult's attitude of learning depends on the learning method such as conventional learning, on-line learning or group discussion. Young adult's level of exposure and the quality of the information accessibility and communications technology is a major consideration that influence their readiness to adapt new learning method (Ismaili, 2021). The relationship between young adult and lecturer in university is essential because both plays a significant role of the successful realisation of the learning processes (Delos & Torio, 2020). Therefore, they must work together to build trust and motivation and by having those, it leads towards learning attitude. Recently, VR have arisen as enablers of reality-enhanced communication, where physical service experiences and digitalisation are combined in one platform and seamlessly blended (Hilken et al., 2021; de Keyser et al., 2019). For example, by using virtual reality, young adult's visualise tourism education through VR and decide the best place to visit by having 'a look' first before actually visiting (Shen et al., 2022). This shows that, if the young adults are always excited using VR to improve knowledge, it leads towards happiness attitude when using VR. Young adults learning attitude should respect different opinions and communicate clearly with good articulation. Communication skills are important skills for developing great interpersonal skills among students (Febrianita & Hardjati, 2019). Learning outcomes must be well-structured and the instructions provided to them need to be respectful to their vocabulary. According to Claro et al., (2018), the academic technological performance of the students holds an important criterion that is communication which is engaging digital efficiency in education today. Not only sharing knowledge but gaining subject-based ideology from the mentors is a productive factor on school premises. The importance of giving priority to digital communication skills has a significant in young adult learning attitude.

### **3. THEORETICAL FRAMEWORK**

This study adapts Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012) to evaluate young adult's acceptance in using virtual reality technology

towards learning and the impact on attitude. Venkatesh et al., (2003), uses UTAUT with Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI), and Facilitating Conditions (FC), as the most important factors for technology acceptance. UTAUT is considered one of the most complete models of technology acceptance since the models are integrated with technology acceptance and many researchers use this model for acceptance and use related research. UTAUT was later combined with three new constructs, Hedonic Motivation (HM), Price Value (PV) and Habit (H) as backgrounds of behavioural intention and use behaviour in the UTAUT2 framework. This VR study uses UTAUT 2, an adaptation of UTAUT in explaining and predicting behavioural intention and use behaviour of young adults towards VR in learning. Figure 1 explains the VR theoretical framework that consists of 2 main dimensions which are Virtual Reality Acceptance & Use and learning attitude. This theoretical framework adapts Unified Theory of Acceptance and Use of Technology 2 (UTAUT2) (Venkatesh et al., 2012) to evaluate young adult acceptance of receiving a new technology in learning (Gagne, 1985). This framework assesses acceptance of virtual technology by measuring behavioural intention to use a given technology and its impact on learning attitude. Learning attitude looks into excitement, happiness and confidence level of young adults' VR as an alternative learning tool in the education sector.

The construct of PE is a factor to determine the extent of young adults in perceiving VR as a learning device that would contribute to additional improvement in obtaining new knowledge (Venkatesh et al., 2012). The construct of EE looks into the extent in which young adults perceive VR as easy to use and it has a simple operational function (Chao, 2019). The construct of SI is being used to analyse the extent in which young adults perceive the expectations of their friends, peers, family members and lecturers on their use of VR. Wu et al., (2021) have found that social influence has a great impact on users' intentions to accept new technology. HM is the last construct used in this theoretical framework related to UTAUT 2, in order to evaluate young adults perceiving VR as a tool that brings additional joy and enjoyment (Toyoda et al., 2021; Lowry et al., 2015, 2013). All the constructs that have been conceptualised are being used to determine the main factors influencing Virtual Learning Behavioural Intention (VLBI). The UTAUT 2 is being combined with Domains of Learning by Gagne (1985) to study the relationship of learning attitude among young adults. Gagne (1985) focuses on intentional learning, which is the form of learning that occurs in particular training programs where the environment influences the learning process. The Domains of Learning consists of five (5) learning that affect the learning process which are motor skills, verbal information, intellectual skills, cognitive strategies, and attitudes. This theoretical framework only focuses on learning attitude where young adults observe and learn through feedback by using VR. These capabilities are the behavioural changes in learning and once the learning results are being identified, an analysis of the conditions that manage learning and remembering to occur (Gagne, 1985).

According to Ting & Tien (2021), behavioural change is evaluated through learning effectiveness, motivation, and attitude by having sequential analysis of gaming tasks. Gagne also describes human performance as established by learning attitude where attitudes have a significant role in influencing an individual's actions and require young adults to observe and learn from those who provide feedback. Young adults are motivated with a new learning method in gaining knowledge thus this motivation brings a positive attitude towards learning (Sitepu et al., 2021). A good learning attitude leads towards effective learning (Claro et al., 2018). VR provides a different learning experience for young adults as they have an opportunity to learn by doing rather than just reading (Hilken et al., 2021). The increasing of digitalisation technology is an advantage that the education sector should investigate by boosting young adults' learning attitude by providing interactive learning. The four-construct used, PE, EE, SI, HM are the factors influencing acceptance and use for VR technology towards young adults' learning attitude.

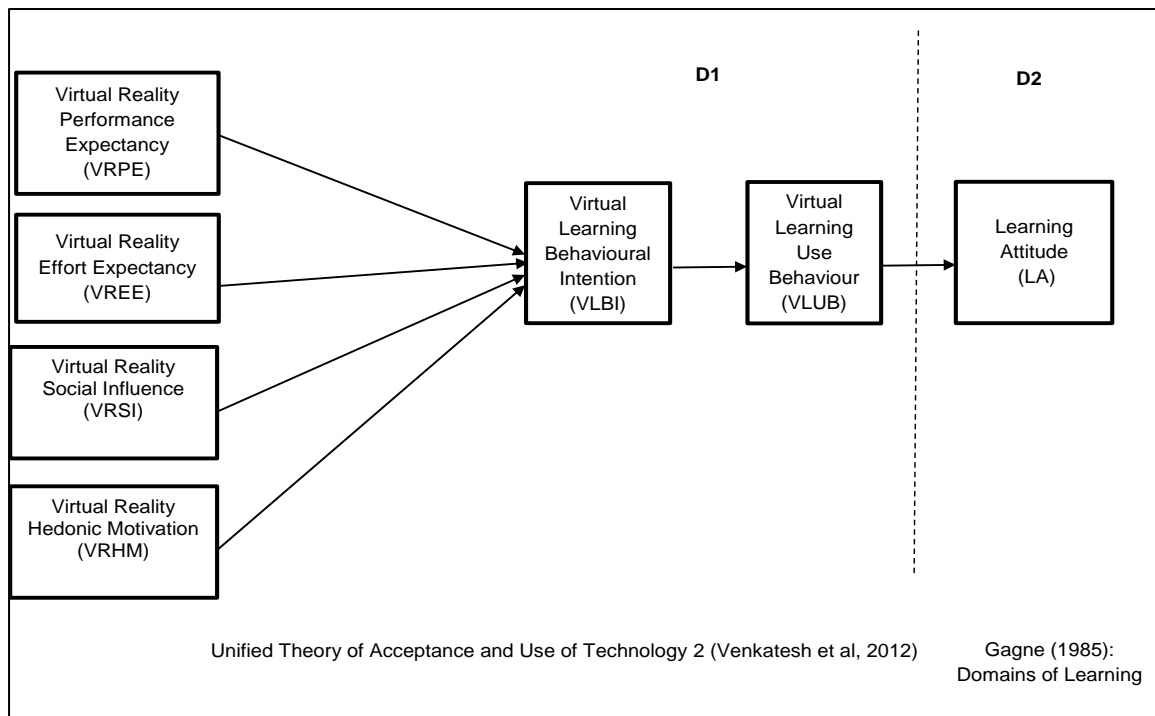


Figure 1 Research Theoretical Framework

The following hypotheses obtain from research theoretical framework in Figure 1.

- $H_1$  There is a significant relationship between Virtual Reality Performance Expectancy (VRPE) and Virtual Learning Behavioural Intention (VLBI) among young adults.
- $H_2$  There is a significant relationship between Virtual Reality Effort Expectancy (VREE) and Virtual Learning Behavioural Intention (VLBI) among young adults.
- $H_3$  There is a significant relationship between Virtual Reality Social Influence (VRSI) and Virtual Learning Behavioural Intention (VLBI) among young adults.
- $H_4$  There is a significant relationship between Virtual Reality Hedonic Motivation (VRHM) and Virtual Learning Behavioural Intention (VLBI) among young adults.
- $H_5$  There is a significant relationship between Virtual Learning Behavioural Intention (VLBI) among and Virtual Learning Use Behaviour (VLUB) among young adults.
- $H_6$  There is a significant relationship between Virtual Learning Use Behaviour (VLUB) and Learning Attitude (LA) among young adults.

#### 4. METHODOLOGY

This research uses cross-sectional survey where questionnaire was distributed to young adults, ages 18 to 25 years old (Adams et al., 2021; Peng et al, 2020; Higley, 2019) in Shah Alam, Selangor, Malaysia. The researcher chooses this age category because this age is a development period where young adults emotional changes and substantial cognitive have an impact on brain development and this age group have behavioural adjustments associated with basic psychosocial age-related developmental tasks (Richard at al., 2015). They were 58% of female and 42% of male took part in this questionnaire. Table 1 indicate the age demographic participated for this cross-sectional survey.

Table 1 Demographic for participant (n = 200)

Age Group (years)	Frequency (n)	Percentage (%)
18 – 20 years old	57	28.5
21 – 23 years old	66	33
24 – 25 years old	77	38.5

The instrument developed is structured in which all questionnaire is straight forward related to VR acceptance among young adults and instrument developed, answers the objective of the research. All items are being divided into 2 section which are A: Demographic, B: Acceptance and Use of Technology. All questions in section B are asked using a 5-Point Likert Scale with “1” being Strongly Disagree, “2” being Almost Disagree, “3” being Neutral, “4” being Agree and “5” being Strongly Agree. They are 42 closed-ended questions including demographic section. The objective of the survey is to describe whether relationship exists between virtual reality technology and learning attitude toward young adults in Shah Alam. This study emphasis on non-probability sampling design as part of the sampling strategy. Non-probability sampling is use in this study because randomisation is impossible for young adults as the population is very large and time limitation to conduct the study (Pace, 2021, Etikan et al., 2016). The result of the research is not being targeted to produce findings that will be used to create generalisations pertaining to the whole population. Therefore, convenience sampling was done where participants of the target population meet age criteria, easy geographical access and willing to participate in the research was given a set of questionnaires. Each respondent answered the same set of survey that was being distributed to 200 young adults in Shah Alam vicinity. Before the data was collected, reliability and normality test were done. Cronbach’s Alpha reliability test was run in order to crisscross the reliability of the research instrument (Field, 2009). The acceptable value of this test is 0.70 (Nunnally & Bernstein, 1994). Table 2 shows all Cronbach’s Alpha values are more than 0.70 except for VREE which is 0.638, close to 0.70.

Table 2 Summary Results of Reliability Analysis (n = 200)

Variable	Number of items	Cronbach’s alpha
VRPE	6	.718
VREE	6	.638
VRSI	5	.716
VRHM	5	.869
VLBI	5	.847
VLUB	6	.792
LA	5	.867

Normality test, namely, Skewness test and Kurtosis was performed to test the data normality. Table 6 shows the test of normality for 7 variables applied to this questionnaire. Skewness and Kurtosis index was being used to identify the normality of the collected data with SPSS (Pallant, 2013, 2005). The data considered being normal for the range of skewness from -3 to +3 and kurtosis -10 +10 (Brown, 2006). The skewness index range was from -1.304 to -.118 and the kurtosis index range was from -.48 to 2.441. Therefore, this conclude that the data collection was normal distributed as both the skewness and kurtosis index of 7 variable presented are within the normal distribution range. Table 3 Test of Normality (n = 200).

Table 3 Test of Normality (n = 200)

Variable	N	Skewness		Kurtosis	
		Statistic	Std. Error	Statistic	Std. Error
VRPE	200	-.297	.172	-.948	.342
VREE	200	-.431	.172	-.234	.342



VRSI	200	-.118	.172	-.765	.342
VRHM	200	-1.016	.172	.315	.342
VLBI	200	-.928	.172	-.035	.342
VLUB	200	-.658	.172	.673	.342
LA	200	-1.304	.172	2.441	.342

The Kaiser–Meyer–Olkin (KMO) was performed to test validation on ensuring the data is suitable to proceed for factor analysis. KMO was performed to analyse the strength of the partial correlation between the variables. KMO values closer to 1.0 are consider ideal while values less than 0.5 are unacceptable (Napitupulu et al.,2017). The Bartlett’s test of Sphericity is being used to test the null hypothesis that the correlation matrix is an identity matrix, that mean, variables are unrelated and not ideal for factor analysis (Rojas et al., 2015). Table 4 shows the result for KMO & Bartlett’s Test with result .716 which is close value to 1.0 and this result is acceptable.

Table 4 Test of KMO & Bartlett’s Test

Kaiser–Meyer–Olkin Measure of Sampling Adequacy		.716
Bartlett’s Test of Sphericity	Approx. Chi-Square	8769.475
	df	703
	Sig.	.000

## 5. RESULTS AND DISCUSSION

### 5.1 To Identify VR Factors Influencing Virtual Learning Behavioural Intention (VLBI)

An assessment using one tailed test was done to review the likelihood of the relationship in single direction and completely disregarding the possibility of a relationship in the other direction. Table 8 indicates the results of factors influencing VLBI by using Pearson Correlation and Regression. Based on the result relating to Pearson Correlation, the researcher finds out that VRHM ( $r = .741$ ) is main factor that influences the relationship between VLBI in the first dimension. Previous research done by Bower & Lai (2020) and Kim & Hall (2019) indicate similar results where hedonic motivation predicts behavioral intention in accepting new technology. The next result of Pearson Correlation follows by VREE ( $r = .594$ ) and VRPE ( $r = .544$ ). The least factor that influences the relationship between VLBI is VRSI ( $r = .304$ ), however this factor is still significant towards the study because young adults perceive the expectations of using VR through of their peers, family members and lecturer. However, based on the result, it shows that young adults in Shah Alam are willing to learn without having strong influences by the society. This is supported by study conducted by He & Li, (2019). The researcher generated the result of Regression for the study using VR towards factors influence VLBI. It shows that, in the first dimension, VRHM relationship towards VLBI ( $R^2 = .549$ ). Thus, this is the main factor influenced the intention among young adults on using VR. The second highest result for regression was VREE ( $R^2 = .352$ ), followed by VRPE ( $R^2 = .269$ ) and lastly VRSI ( $R^2 = .092$ ). The construct of VRPE, VREE, VRSI, VRHM does have significant relationship between VLBI among young adults thus hypothesis  $H_1$ ,  $H_2$ ,  $H_3$  and  $H_4$  has been answered. Several studies confirmed that PE, EE, SI and HM have a significant influence on BI to accept new technology, such as an e-scooter VR service (Huang, 2020), VR intention in chemical industry (Toyoda et al., 2021), VR games for chemical education (Chioma et al., 2021) and head-mounted VR displays in learning (Shen et al., 2019). Since this study focused on acceptance and use of VR and its impact on learning attitude, the constructs play a significant role in young adult acceptance and use of VR technology. This technology has matured to the point where it is practically used in different market segmentation especially gaming and this

alternative learning has enhanced learning process methods and has improve the traditional way of teaching (Bistaman et al., 2018).

Table 5 Summary Results of Pearson Correlation (n = 200, a=0.05)

Variable	Pearson Correlation (r)	Regression (R <sup>2</sup> )
VRPE > VLBI	.544	.269
VREE > VLBI	.594	.352
VRSI > VLBI	.304	.092
VRHM > VLBI	.741	.549

### ***5.2 To Identify Virtual Learning Behavioural Intention (VLBI) and Its Impact Towards Virtual Learning Use Behaviour (VLUB)***

VLBI has an impact on VLUB where the Pearson Correlation result of the study indicated that ( $r = .804$ ) and the result of Regression for the study is ( $R^2 = .646$ ). This result shows that VLBI has significant values on VLUB thus  $H_5$  has been answered. The globalisation world with the innovation of technology has transform education to digitalisation platform such as virtual learning, online learning and Google Meet in delivering their learning program (Adnan & Bahar, 2019). It's a new norm in the education field especially for universities where learning with digital technology has grown popular in recent years. As the respondents are young adults ages 18-25 years old, they are excited and happy exploring and using new technology as an alternative to learning. Online learning has become more necessary in the year 2020 when the world was attack by COVID-19 (Lee, 2022). During this pandemic outbreak, all sectors were badly hit, including education. Individuals are forced to stay home and encourage social distancing to stop the spreading of the deadly virus. Therefore, worldwide students turned their learning approach from the physical classroom to digital learning education (Marban et al., 2021). VLBI has a strong impact on VLUB because VR for learning may be used anytime comparing to conventional learning where they are time limitation for a subject. This is proven when 60% of the respondent strongly agree that "learning using VR in university is interesting". This shows that young adults could certainly retrieve the knowledge and learn something, anytime and anywhere, as long as the VR device is working. 54% of young adults strongly agree that studying using VR is their top priority and will continue using this device for learning.

### ***5.3 To Study the Acceptance and Use Of Virtual Learning Use Behaviour (VLUB) and Its Impact Towards Learning Attitude (LA)***

On the second dimension, where LA is the dependent variable, researcher find out that VLUB influence LA with Pearson Correlation result ( $r = .708$ ) and the result of Regression for the study is ( $R^2 = .501$ ). This result shows that  $H_6$ , there is a significant relationship between VLUB and LA among young adults. The introduction of graphics-oriented visual has made huge changes in use behaviour that leads towards learning attitude. The application of virtual elements in education such as animated images attract young adults in helping them to understand and remember the substance (Bistaman et al., 2018). The object oriented created in VR technology features improve understanding compare with the complex explanation and it facilitates young adults to learn easier and faster. The analysis shows that 50.5 % young adults strongly agree in using VR as a learning tool and 30 % agree on this particular matter. Mathematically, 80.5 % young adult are interested in learning using VR as this alternative learning support of seamless interaction between real and virtual environments. VR technology improve since the ability of virtual reality provide non-accessible learning environment because

it's too hazardous or too costly like learning in construction site, activity at active volcanoes or even experience real space shuttle (Shamsudin & Yunus, 2022). This advantage of VR is impossible to be provided in conventional learning therefore VR bring the real experience to the classroom. Virtual technology has grown, and more range of education application domains are benefiting from this and it is valuable (Bistaman et al., 2018). Due to rapid growth in online digitalisation (e-sports and e-property) where it affects use behaviour towards learning attitude, VR is initially growing in popularity due to its potential and the advantages that provide good benefits to the education sector. Ministry of Education in Malaysia must emphasis on collaboration with school and university on digitalisation policy. This new method of learning is part of Malaysia Education Blueprint, Shift 7 (System Structure), where its emphasis on leveraging information technology on self-paced learning (Ministry of Education, 2012).

## **6. CONCLUSION AND RECOMMENDATIONS**

The purpose of this study aims to identify virtual reality acceptance and use among young adults and its impact towards learning attitude. One of the impactful growths of VR is the use of virtual technology in the education sector where university and school are emphasising on alternative way of learning. The emerge of COVID-19 has brought all school and university in the world to shift everything towards online education even the facilities are not good enough. Modern communication technologies such as google meet, zoom meeting, 360-degree videos and google classroom are used to facilitate this online education learning and not everyone would be able to join as they require a device as long as they have internet connectivity. Technology accelerate because of the COVID-19 and this disease has been regarded as one of the most important events of the twenty-first century. This was an important factor of accepting new technology and this study adapts unified theory of acceptance and use of technology 2 by Venkatesh et al., (2012) to evaluate young adult's acceptance in using virtual reality technology towards learning and its impact on young adult attitude. Four main constructs were used to evaluate the acceptance of technology which are Performance Expectancy (PE), Effort Expectancy (EE), Social Influence (SI) and Hedonic Motivation (HM) as indicated at Figure 1. The UTAUT2 was used to forecast behavioural intention and use behaviour of young adults towards VR in dynamic learning environment and evaluate influences that are relevant to the technology acceptance.

VR has gained attention as a potential tool for enhancing learning attitudes and outcomes. Several studies have investigated the acceptance of VR in educational settings and its impact on learning attitudes. Astuti et al., (2020) conducted a study on high school students to investigate the effect of 3D visualisation in VR on critical thinking skills and scientific attitudes. The study used a quasi-experimental design and found that the use of 3D visualisation in VR improved students' critical thinking skills and scientific attitudes. A different study was done by Kim and Ahn (2021) that focuses on nursing students and examined the influence of VR-based learning on cognitive and emotional variables. The study found that there is a need to confirm how education through VR affects these variables. The study also highlighted the importance of understanding learners' perception of VR technology and its characteristics in order to assess its impact on learning attitudes. Hussein et al., (2020) investigated the interaction between VR glasses tracking types and cognitive style in the development of English vocabulary skills and immersion among primary stage pupils with learning difficulties. The study found that positional VR glasses tracking helped pupils navigate freely and increased their curiosity and excitement, leading to better English vocabulary skills and immersion. These three studies that is done for different age groups indicated that VR has a significant impact towards learning attitude.

The outcomes of this research have theoretical implications. First, the study contributes in building up knowledge surrounding VR as an alternative learning method. The acceptance validated that established construct in UTAUT2 may be broadened and used to different virtual technology such as Augmented Reality (AR) or hologram as an alternative for learning environments in education sector. The validated acceptance and use could be further adapted to assess user cognitive skills and behavioural on dynamic education and training environments. Second, the framework further validated factors that may be relevant to understand young adults' objective toward using VR for learning purposes. VRHM was validated as the most significant factors acceptance and use of technology toward behavioural intention to used VR in learning. All hypothesis showed that there is a significant relationship between independent and dependent variable. Furthermore, this study demonstrates that the framework is a helpful tool to understand how young adults perceive using VR and its impact towards learning attitude. This validated acceptance and use may be adapted by future researchers and value add the construct in order to evaluate VR in different market segmentation such as medical training, operations flight simulation and gaming. This would allow for more understanding of how these factors explain user behaviour and cognitive skills with similar technologies.

This study has four main limitations. First, the representation of this study is limited. Although the findings are based on data collected from young adults, the results may not generalise to all young adults in Shah Alam, Malaysia. However, results may be used to inform future researcher regarding acceptance and use of VR technology towards learning attitude. Second, data were collected using non-probability sampling where convenience sampling method was involved over two months in year 2022. Participants were voluntarism and meet the age criteria. The findings should not be generalised to all young adults in Shah Alam. Moving forward, future researcher should use probability sampling to get more accurate data and use this data as a base of the research. The next limitation is the construct used in the utaut2 model. The scale of the study limited the construct used in evaluating the behavioural intention of using VR. Other construct such as facilitating condition or habit may have a different impact towards the framework and may provide different outcomes.

Future research could possibility look into the factors of the validated acceptance and use and revise them appropriately according to their subject matter. The last limitation is the survey instrument used in this research. The survey instrument on this study focuses on acceptance and use of VR towards learning. However future researcher could value add the instrument based on their subject such as medical, gaming or property management. Moving forward, the future researcher should value add current survey instrument to other immersive simulation technologies, such as holograms, augmented reality or simulators used in task training. By value adding, different outcomes will be generated for different target groups. Proper revision, future researcher may use the validated survey instrument to value-add research contexts, populations and technologies. In conclusion, this study presented recommendations for VR acceptance and use in formulating suitable strategy towards learning attitude among young adults in Shah Alam, Malaysia.

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## AUTHORS' CONTRIBUTION

The main author wrote the paper and did all the work. He wrote all the sections that constitute the entire article from Introduction to Conclusion and his supervisor KM and WHA did the checking and value add the article.

## CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

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## APPENDIX

Series No: \_\_\_\_\_

### THE USE OF VIRTUAL REALITY TECHNOLOGY AND IT'S IMPACT TOWARDS LEARNING ATTITUDE AMONG YOUNG ADULTS IN SHAH ALAM, SELANGOR, MALAYSIA

#### Section A: Demographic

1. Umur (*Age*):
  1. 18 tahun – 20 tahun   
(*18 years old – 20 years old*)
  2. 21 tahun – 23 tahun   
(*21 years old – 23 years old*)
  3. 23 tahun – 25 tahun   
(*23 years old – 25 years old*)
  
2. Jantina (*Gender*):
  - a. Lelaki (*Male*)
  - b. Perempuan (*Female*)
  
3. Adakah saudara / saudari mempunyai pengalaman menggunakan Virtual Reality? (*Do you have any experience using Virtual Reality?*) 
  - a. Lebih sekali dan kurang 5 (*More than once and less than 5 times*)
  - b. Lebih 5 kali dan kurang 10 (*More than 5 times and less than 10 times*)
  - c. Lebih 10 kali (*more than 10 times*)

#### SECTION B – H : ACCEPTANCE AND USE OF TECHNOLOGY (UTAUT)

- 1- Sangat Tidak Setuju    2– Tidak Setuju    3- Neutral    4- Setuju    5- Sangat Setuju  
 (*Strongly Disagree*)    (*Disagree*)    (*Neutral*)    (*Agree*)    (*Strongly Agree*)

No	Statement	1	2	3	4	5
<b>B</b>	<b>VIRTUAL REALITY PERFORMANCE EXPECTANCY (VRPE)</b>					
VRPE1	Penggunaan Virtual Realiti (VR) membuatkan saya selesai tugas dengan cepat <i>Using Virtual Reality (VR) would enable me to complete the task quickly</i>					
VRPE2	VR membolehkan saya akses kepada pembelajaran dengan mudah <i>VR would enable me to have easy access to learning</i>					
VRPE3	Penggunaan VR menyebabkan perjumpaan dengan pensyarah menjadi berkurangan untuk menimba ilmu <i>Using VR reduce face to face contact with lectures on learning new knowledge</i>					
VRPE4	Penggunaan VR dalam pembelajaran membantu kemahiran hidup saya <i>Using VR help learning material fit into my life</i>					
VRPE5	Penggunaan VR dalam pembelajaran amat sesuai di universiti <i>VR for learning is useful for in university</i>					
VRPE6	Penggunaan VR membantu saya dalam pembelajaran <i>Overall the use of VR helps me in learning</i>					
<b>C</b>	<b>VIRTUAL REALITY EFFORT EXPENTANCY (VREE)</b>					
VREE1	Interaksi saya dengan Virtual Realiti (VR) amat jelas dan saya memahami pembelajaran <i>My interaction with Virtual Reality (VR) is clear and understandable in learning</i>					
VREE2	VR mudah digunakan dalam pembelajaran di universiti <i>VR is easy to use for learning at university</i>					
VREE3	Saya tidak perlu menggunakan usaha yang tinggi untuk menggunakan VR dalam pembelajaran <i>I do not need high effort to use VR in learning</i>					
VREE4	Saya tidak memerlukan kepakaran teknikal untuk menggunakan VR dalam pembelajaran pengakap <i>I do not require much technical expertise to effectively use VR in learning</i>					
VREE5	Penggunaan VR dalam pembelajaran menjimatkan masa apabila dibuat perbandingan dengan cara pembelajaran lama <i>The use of VR in learning reduces time comparing with conventional learning method</i>					
VREE6	Saya tidak memerlukan kepakaran teknikal untuk menggunakan VR dalam pembelajaran <i>I do not require much technical expertise to effectively use VR in learning</i>					
<b>D</b>	<b>VIRTUAL REALITY HEDONIC MOTIVATION (VRHM)</b>					

No	Statement	1	2	3	4	5
VRHM1	Penggunaan Virtual Realiti (VR) dalam pembelajaran adalah mengembirakan <i>Using Virtual Reality (VR) in learning is fun</i>					
VRHM2	Penggunaan VR dalam pembelajaran adalah menyeronokan <i>Using VR in learning is enjoyable</i>					
VRHM3	Penggunaan VR dalam pembelajaran adalah menghiburkan <i>Using VR in learning is entertaining</i>					
VRHM4	Penggunaan VR dalam pembelajaran adalah menyenangkan <i>Using VR in learning is pleasant</i>					
VRHM5	Penggunaan VR dalam pembelajaran adalah memuaskan <i>Using VR in learning is satisfying</i>					
<b>E</b>	<b>JUNIOR SCOUT VIRTUAL REALITY SOCIAL INFLUENCE (VRSI)</b>					
VRSI1	Orang yang penting bagi saya mengesyorkan penggunaan Virtual Realiti (VR) <i>People who are important to me recommend using Virtual Reality (VR)</i>					
VRSI2	Rakan sebaya menjangkakan saya menggunakan VR bagi pembelajaran pengakap <i>My peers expect me to use VR for scout learning</i>					
VRSI3	Cikgu menjangkakan saya menggunakan VR bagi pembelajaran pengakap <i>My teacher expects me to use VR for scout learning</i>					
VRSI4	Orang ramai mengharapkan saya menggunakan VR bagi pembelajaran pengakap <i>The public will expect me to use VR for scout learning</i>					
VRSI5	Penggunaan VR amat sukar sekiranya tiada maklumat mengenainya <i>Using VR is difficult if there are no information regarding it</i>					
<b>F</b>	<b>VIRTUAL LEARNING BEHAVIORAL INTENTION (VLBI)</b>					
VLBI1	Saya amat teruja untuk menggunakan Virtual Realiti (VR) bagi pengakap <i>I am so excited to use Virtual Reality (VR) in learning</i>					
VLBI2	Saya mempunyai sifat keterbukaan untuk menggunakan VR dalam pembelajaran <i>I am open to learn on how to use VR in learning</i>					
VLBI3	Penggunaan VR dalam pembelajaran di universiti amatlah menarik <i>Learning using VR in university is interesting</i>					
VLBI4	Saya bercadang untuk menggunakan VR dalam pembelajaran secara berterusan <i>I plan using VR learning continuously</i>					

No	Statement	1	2	3	4	5
VLBI5	Saya sentiasa akan menggunakan VR dalam pembelajaran dan ulagkaji <i>I always try to use VR in learning and revision</i>					
<b>G</b>	<b>VIRTUAL LEARNING USE BEHAVIORAL (VLUB)</b>					
VLUB1	Saya menggunakan Virtual Realiti (VR) bagi pembelajaran <i>I use Virtual Reality (VR) for learning</i>					
VLUB2	Saya kerap menggunakan VR bagi pembelajaran <i>I often use VR for learning</i>					
VLUB3	Saya mengesyorkan VR kepada kawan dan juga saudara mara <i>I recommend VR to friends and relatives</i>					
VLUB4	Saya pernah hadapi masalah dengan pembelajaran dan menggunakan VR untuk menyelesaikannya <i>I have encountered problems related to my study and use VR to solve it</i>					
VLUB5	Saya meminati pembelajaran melalui kaedah VR <i>I am interested in learning through VR</i>					
VLUB6	Saya menggunakan VR untuk memperbaiki kemahiran komunikasi <i>I use VR for to improve my communication skills</i>					
<b>H</b>	<b>LEARNING ATTITUDE (LA)</b>					
LA1	Saya amat teruja menggunakan Virtual Realiti (VR) untuk pembelajaran <i>I am excited using Virtual Reality (VR) for learning</i>					
LA2	Saya suka meneroka aktiviti dengan menggunakan VR bersama rakan saya <i>I like exploring activities using VR with my friends</i>					
LA3	Saya sentiasa yakin apabila menggunakan VR untuk pembelajaran <i>I am always confidence when using VR for learning</i>					
LA4	Saya sentiasa gembira apabila menggunakan VR untuk pembelajaran <i>I am always happy when using VR for learning</i>					
LA5	Saya sentiasa memikirkan pembelajaran melalui VR <i>I am always thinking of learning through VR</i>					