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Application of VAM to Examine the Virtual Tourism Adoption among Undergraduate Students in Malaysia

Khaslinda Akasyah Mujin[1] **& *Tay Kai Xin**[1]

[1]Faculty of Business, Economics, and Accountancy,
Universiti Malaysia Sabah
Jalan UMS, 88400 Kota Kinabalu, Sabah, Malaysia

Corresponding author's email: taykaixin@ums.edu.my

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ABSTRACT

Over the past few years, there has been a gradual yet consistent surge in the utilization of virtual tourism (VT) within the tourism industry despite the challenges posed by the recent COVID-19 outbreak. Similarly, there is a prevailing belief that VT in the educational sector holds considerable value and offers substantial benefits in shaping an innovative educational experience. However, VT is still seen as a new thing in Malaysia's education sector. Thus, this research aims to examine the undergraduate students' VT adoption by using Value-based Adoption Model (VAM). Employing a quantitative method, 306 completed questionnaires were analyzed using Stata (version 14.2) and Structural Equation Modelling (SEM). The empirical results revealed that the perceived usefulness and enjoyment were positively affecting the VT behavioural intention. However, the perceived cost was found to be statistically significant and positively affected the behavioural intent of VT. The high cost of using VT shows that sacrifices are required. Therefore, the perceived cost would not be a barrier to students taking up VT. This study was limited to only focusing on examining undergraduate students' VT behavioural intention. To provide a more comprehensive understanding of VT adoption, future research could consider extending the study to include a wider demographic range. Considering the evolving nature of technology and tourism trends, longitudinal studies could be conducted to track changes in VT adoption patterns over time, providing valuable insights into the long-term impact of VT on the tourism industry.

Keywords: *Virtual tourism, undergraduate students, VT adoption, Value-based Adoption Model*

1.0 INTRODUCTION

Over the past few years, there has been a gradual and consistent upsurge in the utilisation of virtual tourism (VT) within the tourism industry (Yang et al., 2022). As defined by Ankomah et al. (2019), VT represents an innovative approach to exploring destinations, landmarks, and accommodations without necessitating physical presence. It seamlessly creates an integradtion between realms of virtual reality and tourism, thereby establishing a hybrid concept that encourages users to engage in immersive virtual tours through advanced virtual reality technology. Jayawardene et al. (2023) further expound upon virtual reality as a media-driven simulation of a destination, typically comprising a sequence of multimedia content, including videos or still images harmonised by narrative voice, music, and soundtracks. This orchestration is designed to immerse users in a chosen destination. Furthermore, VT offers the distinct advantage of enabling individuals to embark on virtual tours of attractions right from the comfort of their homes, unhindered by geographical constraints, and generally incurring lower costs compared to physical visits (Benjamin, 2020). This approach eliminates the need for physical mobility, as well as reduces safety concerns and associated risks.

In the tourism industry, VT has found widespread application as an exceptional marketing tool (Griffin et al., 2023). Hotels and attractions can harness virtual reality technology to craft immersive tours showcasing their rooms, facilities, picturesque landscapes, and environmental elements (Revfine, 2022). This incorporation of VT in the realm of tourism extends to simulating actual tourism experiences, including theme park visits, which can encompass both real and virtual rides (Oncioiu et al., 2022). Travel agencies and tour operators strategically leverage social media, websites, and various digital platforms to promote these attractions, thereby effectively attracting visitors to their businesses. In this competitive landscape, becoming at the forefront of VT adoption can set certain destinations and accommodations apart from the rest (OECD, 2020).

VT, at its core, utilises technology to offer access to entertainment, art, culture, and travel experiences, albeit in a remote manner (El-Said et al., 2022). This trend has witnessed rapid development and heightened demand, even within Malaysia, despite the challenges posed by the recent COVID-19 outbreak. Whether attributed to restrictions like the Movement Control Order (MCO) or post-pandemic travel apprehensions, there remains a substantial demand for tourism experiences, catering to a portion of the population that may have previously remained unknown. Consequently, VT has emerged as one of the latest travel trends, poised for sustained growth in the years ahead (Griffin et al., 2023). El-Said et al. (2022) also concur that VT serves as a viable alternative for those unable to embark on physical journeys, providing a feasible substitute for actual travel under the present circumstances.

Similarly, the educational domain confronts analogous circumstances. The constraints imposed by the COVID-19 pandemic, such as travel restrictions and the imperative for social distancing, have given rise to a myriad of concerns in tertiary education. These concerns encompass the shift from traditional to digital and hybrid teaching modalities, which involves various approaches, techniques, and tools. For example, VT has been employed to engage students in virtual field trips enriching students' learning experiences (Olsen et al., 2020). This transformation is aimed at fostering a fresh learning environment and bolster the knowledge acquisition process (Olsen et al., 2020; Radianti et al., 2020; Qiu et al., 2020). There is a prevailing belief that VT holds considerable value and offers substantial benefits in shaping an innovative educational experience (Olsen et al., 2020). Given that undergraduate students represent the future workforce and potential leaders in their respective fields, their engagement with VT is pivotal for equipping them with the skills and insights needed to navigate the evolving educational landscape and contribute to its ongoing advancement (Bergmark et al., 2018).

However, VT is still considered a relatively new phenomenon in Malaysia's education sector. Extensive research has been conducted on VT adoption by both tourism suppliers and students (Kim et al., 2019; Lu et al., 2021; Martins et al., 2020; Tom et al., 2018; Rauscher et al., 2020). However, there has been a noticable gap in research when it comes to investigating the viewpoint of undergraduate students. Consequently, it was found that VT adoption is related to how individuals perceive and adopt the technology. This connection aligns with the Value-based Adoption Model (VAM) as proposed by Kim et al. (2007) to examine and understand the adoption of new technologies. Therefore, the aim of this study is to explore the application of VAM in assessing VT adoption among undergraduate students in Malaysia.

2.0 LITERATURE REVIEW

2.1 Theory of Value-based Adoption Model (VAM)

The Value-based Adoption Model, commonly referred to as VAM, has been applied in the context of technology acceptance. This adaptation is in line with the theory of consumer choice and decision-making, which underscore that users' assessment of the value derived from a technology service stands as a central determinant of their intention to use it (Kim et al., 2007). Within this framework, Kim et al. (2007) assert that VAM places paramount importance on considering the benefits, which encompass both utilitarian and hedonic aspects, along with the associated sacrifices, spanning both monetary and non-monetary dimensions. These elements collectively serve as the primary drivers influencing behavioural intention and are rigorously analysed within this model.

2.1.1 Perceived Benefits

Kim et al. (2007) proffered a definition of perceived benefits as the user's perception of the advantages attainable through technology utilisation. Their research illuminated that perceived benefits wield substantial influence over a user's behavioural intention. Previous studies have established that perceived usefulness, serving as an extrinsic motivator, and perceived enjoyment, functioning as an intrinsic motivator, both play pivotal roles in shaping a user's behavioural intention to engage with technology (Kumar, 2017). In the context of this study, perceived usefulness pertains to students' perceptions of the expected advantages conferred by VT. In alignment with the framework established by Davis (1989), perceived usefulness can be described as the degree to which an individual believes that using a particular technology will enhance their performance. This construct of usefulness closely parallels students' behavioural intention towards adopting VT, as VT has the potential to enhance the learning experiences of students (Davis, 1989; Talwar et al., 2020). Concurrently, perceived enjoyment is delineated as the degree to which students find the activities or services offered by VT enjoyable, irrespective of any anticipated performance-related outcomes (Kim et al., 2007). Extensive research from the past has also substantiated that the element of enjoyment and the experience of fun wield significant influence over technology adoption (Davis et al., 1989). Based on these premises, the following hypotheses thus are formulated:

H_1: Perceived benefits affect students' behavioural intentions toward VT adoption.

H_{1a}: Perceived usefulness would positively affect behavioural intentions toward VT adoption.

H_{1b}: Perceived enjoyment would positively affect behavioural intentions toward VT adoption.

2.1.2 Perceived Sacrifices

Perceived sacrifice can be classified into two primary domains: monetary and non-monetary sacrifices (Zeithaml, 1988). Monetary sacrifice pertains to the tangible cost associated with purchasing a product, while non-monetary sacrifice encompasses elements such as time, effort, and the inherent risks tied to the product (Kim et al., 2007). When products or services incorporate new technologies, they inherently carry risks that may yield unforeseen outcomes. Consequently, consumers may, at times, opt to delay or cancel their purchases (Dhebar, 1996). Furthermore, variables characterized by uncertainty, such as product performance and pricing, or more broadly, perceived sacrifice, exert a substantial influence on behavioural intention (Chen et al., 2003). Andersson et al. (2002) have contended that students' perceptions can be substantially swayed when costs reach levels deemed prohibitively expensive. Additionally, empirical studies have demonstrated that perceived physical risks exert a robust adverse impact on technology adoption, a phenomenon consistently observed in research (Crespo et al., 2009; Glover et al., 2010). Based on these points, the following hypotheses thus are formulated:

H_2: Perceived sacrifice affects students' behavioural intentions toward VT adoption.

H_{2a}: Perceived cost would negatively affect the behavioural intentions toward VT adoption.

H_{2b}: Perceived physical risk would negatively affect the behavioural intentions toward VT adoption.

2.1.3 Behavioural Intention

The concept of behavioural intention has its origins in the Theory of Planned Behavior (TPB), as formulated by Ajzen et al. (1980). As articulated by Ajzen et al. (1980), behavioural intention encompasses the motivational factors that exert influence over a specific behaviour. In this context, the strength of one's intention to engage in a behaviour significantly correlates with the likelihood of that behaviour being actually executed. This behaviour can be profoundly influenced by the perceived benefits and sacrifices

associated with a particular technology (Shukla, 2010). The relationship and connection between perceived benefits and perceived sacrifices with behavioural intention constitues a foundational element in the field of consumer behaviour and decision-making. These constructs are frequently employed to gain insights into how individuals assess and make decisions regarding the adoption of products, services, and technologies.

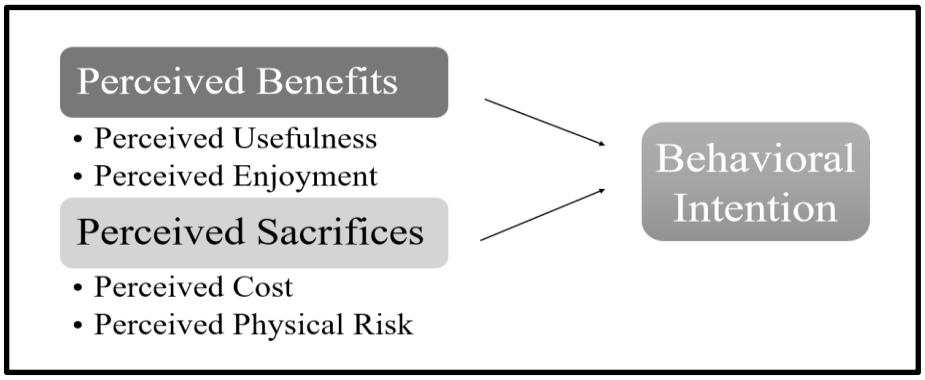

Figure 1: Theoretical Framework

3.0 METHODOLOGY

To investigate the adoption of VT among undergraduate students in Malaysia, this study utilises a probability sampling method, specifically the simple random technique. Given the large sample size, this approach enables the generalization of findings to the broader population. In simple random sampling, each unit within the entire population has an equal chance of selection (Noor et al., 2022). The research instrument is designed to collect two categories of information: (1) demographic data, including gender, age, year, marital status, and travel frequencies, and (2) the perspectives of undergraduate students on VT. Questions pertaining to the perspectives of undergraduate students on VT will be assessed using a 5-point Likert Scale system (1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree).

The survey questionnaire was administered in two languages: English and Malay. These translations were conducted by two professional translators, each a native of their respective languages, and underwent final verification and confirmation by the authors. Due to constraints related to finances, time, and prevailing circumstances, the questionnaire survey was distributed via email, WhatsApp, and Telegram to universities in Malaysia. Prior to the distribution of the questionnaire, researchers sought advice, obtained permission, and coordinated the timing with university lecturers. Prior to data collection, students were informed of the study's rationale and purpose, as well as their right to withdraw from participation at any point. Students were assured of the confidentiality of their responses, with a commitment that their answers would remain anonymous and solely for educational purposes. Furthermore, participants willing to respond were promised a copy of the results analysis for their reference. A total of 306 questionnaire surveys were collected and used for data analysis. Structural Equation Modelling (SEM) path analysis was employed to test the hypotheses.

3.1 Analysis

The data underwent analysis using Stata (version 14.2). The analytical techniques employed included descriptive analysis and structural equation modelling (SEM) to verify the results. Structural education modelling (SEM) is a widely adopted approach to test the complicated cause-effect correlation between latent variables (Barbosa et al., 2016; Suess et al., 2022; Yin et al., 2020). It can also be used to resolve endogeneity concerns by examining direct, indirect, and the total effects between exogenous and endogenous variables. This process is also often referred to as mediation correlation (Chuck Huber, 2014; StataCorp, 2015). For path analysis within a recursive model, chosen because it lacks feedback loops or correlated errors, the equation is as follows:

$$Y=BY+\Gamma X+\alpha+\zeta$$

where Y is the observed endogenous variable, and X is the observed exogenous variable. The purpose of the equation is to estimate the B and Γ coefficients, the intercept is α.

To evaluate the adequacy of the model, equations such as the Root Mean Square Error of Approximation (RMSEA), Comparative Fit Index (CFI), Tusker-Lewis Index (TLI), and Coefficient of Determination (CD) can be employed (StataCorp LLC, 2021). The RMSEA equation involves verifying the fit of the sample to the null assumption:

$$RMSEA = \sqrt{\frac{(X^2_{ms} - df_{ms}}{(N-1)df_{ms}}}$$

where, $df_{ms} = df_s - df_m$. The best fit of RMSEA is more than 0.06 (Hu & Bentler, 1999). The following equations were used to calculate the CFI and TLI of the model as well as its goodness of fit (Bentler, 1990):

$$CFI = 1 - \frac{X^2_{ms} - df_{ms}}{X^2_{bs} - df_{bs}} \quad \text{and} \quad TLI = 1 - \frac{(X^2_{bs} - df_{bs}) - (X^2_{ms} - df_{ms})}{(X^2_{bs}/df_{bs}) - 1}$$

where b is a baseline log likelihood. A CFI or TLI, which is also known as the non-normed fit index, that is close to 1 under baseline is a good fit (StataCorp LLC, 2021). Lastly, Concerning CD, a perfect fit corresponds to a CD of 1. CD is like R2 for the whole model.

4.0 RESULT INTERPRETATION AND DISCUSSION

4.1 Students' Demographic

In Table 1, (Appendix), which represents demographic data, a total of 306 students (132 male, 174 female) took part in this survey to examine VT adoption among undergraduate students. Most of the students answered are between the age of 20 until 25 which is 290 students, followed by the age of 25 and above (10), and the least range of age that answered the questionnaire is 6 students within the age of below 19. Most of them are third year students (178), followed by second year students (82) and first year students (46). As for the student's marital status, 286 of the students are single, 18 are married and 2 are divorced. Most of the students are also asked how frequently they travel throughout the year, and most of the students answer every year (172), meanwhile 78 students answered twice a year, and lastly once every 2 years (56).

4.2 Measurement Items and Reliability Test

Table 2: Measurement Item and Reliability Test

Variables	Label	Freq. / Mean	% / SD	α
Perceived Usefulness (PU)				0.9398
Use of virtual tourism will help me to choose a destination in a better and comfortable way.	PU1	4.3	0.68	
Use of virtual tourism in planning destination travel is very useful for me.	PU2	4.38	0.68	
Using virtual tourism technology will help me to select a destination travel plan more conveniently.	PU3	4.39	0.68	
Perceived Enjoyment (PE)				0.7038
Use of virtual tourism for travel planning is enjoyable.	PE1	4.15	0.81	
I have fun using virtual tourism technology.	PE2	4.13	0.77	
The use of virtual tourism technology in an experience destination provides me a lot of enjoyment.	PE3	4.20	0.73	
Virtual tourism is very boring.	PE4	3.16	1.32	

Perceived Cost (PC)				0.9215
The virtual tourism technology (virtual reality device and internet data pack) would be pricey to me.	PC1	3.41	1.13	
I am not pleased with the cost of virtual tourism technology.	PC2	3.37	1.08	
There are financial barriers (e.g., HMD devices, data cost) to me in using virtual tourism technology.	PC3	3.50	1.08	
Perceived Physical Risk (PPR)				0.9213
Using VR technology could result in eyestrain.	PPR1	3.73	1.09	
I am concerned that using the VR technology may lead to uncomfortable physical side effects such as bad sleeping.	PPR2	3.62	1.05	
I am concerned about the potential health-related risk associated with the use of virtual tourism.	PPR3	3.64	1.11	
I have no health issues that would prevent me from watching virtual tourism for an extended period of time.	PPR4	3.64	1.08	
Behavioural Intention (BI)				0.9103
I plan to use virtual tourism for travel plans in the near future.	VTA1	3.92	0.88	
I intend to use virtual tourism in travel plans in the future.	VTA2	3.82	0.82	
I plan to buy virtual tourism technology to enjoy virtual tourism.	VTA3	4.01	0.97	

Table 2 displays the measurement items along with their corresponding Cronbach Alpha results. For perceived usefulness, a significant proportion of respondents perceive that using VT will be advantageous for selecting a destination in a better and comfortable way (M=4.39, SD=0.68). Furthermore, they find its use in planning destination travel to be very useful (M=4.38, SD=0.68), as well as beneficial for selecting destination travel plans more conveniently (M=4.39, SD=0.68). Meanwhile, for perceived enjoyment, students indicated that using VT for travel planning is enjoyable (M=4.15, SD=0.81). More than half of the students reported having fun (M=4.13, SD=0.77), and the majority expressed that it provides them with a significant degree of enjoyment (M=4.20, SD=0.73). However, some students stated that VT is very boring (M=3.16, SD=1.32).

For perceived cost, many students agreed that the VT technology (virtual reality device and internet data pack) would be pricey (M=3.41, SD=1.13), and expressed dissatisfaction with the associated cost (M=3.37, SD=1.08). Aside from that, there are financial barriers (e.g., HMD devices, data cost) in using the VT technology (M=3.50, SD=1.08). The same goes to Perceive Physical risk, the students were afraid that using the VR technology could result in eyestrain (M=3.73, SD=1.09), lead to uncomfortable physical side effects such as bad sleeping (M=3.62, SD=1.05), and concerned about the potential health-related risk associated with the use of VT (m=3.64, SD=1.11).

Nonetheless, some students indicated that they did not have any health issues that would prevent them from using VT for an extended period (M=3.64, SD=1.08). Despite these concerns, the VT adoption results indicate that a substantial number of students plan to use VT for travel planning in the near future (M=3.92, SD=0.88), intending to incorporate it into their travel plans in the future (M=3.82, SD=0.82), and even planning to buy the technology to enjoy VT (M=4.01, SD=0.97).

4.3 Confirmatory Factor Analysis (CFA) Results

Table 3: CFA Results

CFA	Statistic
RMSEA /Pclose	0.158/.00
CFI	0.818
TLI	0.785
CD	1

The CFA results of the SEM are presented in Table 3. The model exhibited the following fit indices: RMSEA = 0.158, CFI = 0.818, TLI = 0.785, and CD = 1. Table 4 also provides the parameter estimates of the hypothesised model.

4.4 SEM Results

Table 4: SEM Results

Path	β	S.E.	z	P_{sig}	95 conf. interval	
					Lower	Upper
H1a: Perceived Usefulness → Behavioural Intention	0.145	0.073	2.00	0.046***	0.003	0.288
H1b: Perceived Enjoyment → Behavioural Intention	0.587	0.079	7.41	0.000***	0.432	0.742
H2a: Perceived Cost → Behavioural Intention	0.173	0.050	3.45	0.001***	0.075	0.271
H2b: Perceived Physical Risk → Behavioural Intention	-0.028	0.051	-0.57	0.570	-0.128	0.070

The SEM table shown above was to provide the necessary information to predict the dependent variable and determine whether the paths examined contribute statistically to the behavioural intention. As the results showed, three out of four paths are statistically significant with values smaller than 0.05. It means there are significant impacts of perceived usefulness, perceived enjoyment, and perceived cost on behavioural intention. The result presented that perceived usefulness was statistically significant toward behavioural intention (β=0.145, Sig=0.046, z=2), supporting hypothesis 1a. This means that perceived usefulness positively influences behavioural intentions toward VT adoption. The same goes to perceived enjoyment (β=0.587, Sig=0.000, z=7.41), thereby positively affecting behavioural intentions toward VT adoption. However, the relationship with perceived cost differs from the hypothesis. Perceived cost shows a positive correlation with behavioural intentions toward VT adoption (β=0.173, Sig=0.001, z=3.45). this suggests that, contrary to the initial hypothesis, students may perceive greater value from VT compared to its cost. On the other hand, perceived physical risk is not statistically significant with the regard to behavioural intention (β=-0.028, Sig=0.570, z=-0.57), supporting hypothesis 2b. This means that perceived physical risk negatively affects the behavioural intentions toward VT adoption. The SEM path graph is presented in the Appendix for a visual representation of these relationships.

4.5 Discussion

The study aims to examine VT adoption among Malaysian undergraduate students. The SEM results indicate that three out of four hypotheses were accepted. Specifically, hypothesis 1a and 1b were accepted. This implies that perceived usefulness and perceived enjoyment were both found to have a positive correlation with behavioural intentions towards VT adoption. It is believed that the use of VT aids in

selecting destinations but also holds future utility for students. In other words, students' perceived usefulness of VT will directly influence their behavioural intention of using VT. Additionally, students' enjoyment of VT has a positive influence on their travel intentions (Li et al., 2019). Furthermore, it is noted that students perceive VT as enjoyable in its own right, beyond any expected performance-related outcomes (Van, 2004).

Conversely, Hypothesis 2a yielded unexpected results, deviating from the initially hypothesised outcome. Surprisingly, the data indicated that a significant number of students do not prioritise cost considerations when it comes to adopting VT. Instead, they appear quite willing to invest financially in order to partake in the VT experience. This unforeseen discovery suggests a positive connection between the perceived cost of VT and students' behavioural intention. This counterintuitive result may be attributed to the fact that students perceive substantial value in VT that outweighs any associated costs. Furthermore, this observation aligns with the concept of perceived value, which is often understood as a holistic evaluation by students of the utility derived from a product or service in relation to what they invest (Zeithaml, 1988).

In contrast to Hypothesis 2a, Hypothesis 2b, which focused on perceived physical risk, demonstrated a negative influence on behavioural intentions toward VT adoption. This finding suggests that students have reservations about potential physical discomfort or side effects associated with VT, such as eyestrain or sleep disturbances, as well as possible health-related risks. Interestingly, despite the majority of students asserting that they did not possess any health issues that would impede their use of VT technology, this perceived physical risk remained a deterrent. This outcome substantiates the notion that perceived risk encompasses a composite of factors, including the probabilities, uncertainties entailed in purchase decisions, and the potential consequences of unfavorable actions (Arndt, 1968a; 1968b; Cunningham, 1967; Gronhaug, 1975; Ulleberg et al., 2003).

This study has developed and subsequently tested a comprehensive model incorporating the constructs of VT's VAM. Remarkably, the findings of this research align seamlessly with the outcomes of previous studies (Li et al., 2021). The results underscore a consensus among participants that VT significantly enhances the process of selecting a destination, rendering it a more informed, practical, and convenient endeavour for students. Furthermore, these findings illuminate the profoundly positive influence of VT attributes on students' overall travel experiences. One noteworthy example pertains to the environmental benefits it offers, exemplified by reduced Carbon Dioxide (CO2) emissions due to reduced travel, diminished litter, decreased impact on flora and fauna, and less disruption to natural ecosystems and wildlife (Yang et al., 2022). This multifaceted advantage not only accrues to the benefit of stakeholders such as tourism organizations and operators but also extends its positive ramifications to communities and, most notably, students. Intriguingly, VT serves as a dual catalyst in this context. Not only does it function as a potent marketing tool for tourism entities, but it also possesses the latent potential to stimulate physical tourism (Rakesh et al., 2021). This synergy between virtual and physical tourism represents a dynamic force capable of reshaping the travel landscape, benefiting diverse stakeholders while simultaneously promoting sustainable and responsible tourism practices.

Subsequently, it becomes evident that students' perceptions of enjoyment while engaging with VT wield a substantial and favourable influence on their overall trip experience. VT products and services have the power to shape the emotional landscape of students throughout their journeys. The concept of perceived enjoyment emerges as a pivotal factor, demonstrating its pronounced significance in determining the level of satisfaction students derive from their travel experiences. This aligns seamlessly with prior research findings by Cheng et al. (2022). These outcomes emphasise the critical importance of meticulously considering the emotional aspects of VT design, as it directly contributes to fostering contentment and enhancing the quality of students' travel adventures. Furthermore, it is worth noting that, according to the collected data, satisfaction positively contributes to students' subjective well-being (McLean et al., 2023). It is paramount to emphasise that when VT is thoughtfully integrated into students' activities, it holds the potential to significantly elevate their subjective well-being. Given these revelations, the pivotal role of VT in augmenting the overall visitor experience stands firmly established.

Furthermore, the concept of perceived cost addresses the financial implications associated with the utilization of VT. This dimension emphasises the need to incur significant expenses while acknowledging the potential satisfaction it brings to consumers. The perception of VT as a high-cost endeavor signifies that individuals are willing to make sacrifices to access its benefits. Several students concurred that the

expenses related to VT were substantial, yet they found the investment justifiable given the quality of the experience it provided. Consequently, these students were willing to pay the steep charges associated with VT, despite the substantial financial outlay. However, it is crucial to recognise that engaging with VT can entail additional financial burdens and constraints. Owning and utilizing hardware such as Head-Mounted Display (HMD) devices, as well as covering data expenses for a premium VT experience, represent some of the financial barriers that may deter potential users. In essence, these additional costs could act as deterrents, necessitating careful consideration of the financial aspects involved in VT adoption.

The findings also raise concerns about potential adverse effects on students when utilizing this technology. Beyond the risk of eyestrain, the adoption of VT could contribute to the development of unhealthy sleeping patterns among students. Given its novelty, there is a heightened susceptibility, particularly among young individuals, to become addicted to VT. This notion finds corroboration in the research by LeGates et al. (2014), which links difficulties in falling asleep to prolonged exposure to blue light emitted by digital devices, a phenomenon commonly associated with VT engagement. Consequently, individuals who embrace this technology may encounter various health-related symptoms. Interestingly, the majority of surveyed students expressed apprehension regarding the potential health risks associated with VT usage. Nevertheless, there are students who assert that they do not possess any pre-existing health issues that would hinder their prolonged engagement with VT. These contrasting perspectives underscore the need for further examination and consideration of the potential health implications associated with the enthusiastic adoption of VT among students.

Shifting the focus to students' adoption of VT, it becomes evident that a substantial number of students are strategically planning and expressing their intent to incorporate VT into their future travel plans. Their rationale is rooted in the cost-effectiveness of VT, as it allows them to save financial resources that might otherwise be spent on physical travel or on acquiring specialised technology solely for VT enjoyment. This burgeoning interest in VT technology among students signals a trajectory where VT is poised to become increasingly prevalent in the future. It is foreseeable that this technology will exert a profound influence on the dynamics of future travel experiences. This phenomenon is hardly surprising, given the prevailing sentiment among individuals today that VT technology holds the potential to significantly enhance convenience in various aspects of human life.

5.0 CONCLUSION

In light of the compelling insights from El-Said et al. (2022), it is evident that the horizon of VT is poised for significant expansion in the coming years. This study, at its core, sought to unravel the behavioural intentions of undergraduate students towards embracing VT adoption. The overarching objective was to pave the way for a more effective and efficient future in tourism, while also rekindling the enthusiasm of undergraduate students, particularly in the aftermath of the prolonged pandemic, which cast its shadow over human life for nearly two years, leaving a profound impact on the service industry. Through this exhaustive review, the researchers embarked on a quest to uncover the latent potential of VT, with the intention of catalysing its impact on the future of the tourism industry. This study's diligent efforts culminated in a trove of supporting data that sheds light on the core aspirations of VT.

The findings unequivocally reveal a noteworthy trend: the readiness of students to embrace VT, even when it occupies a relatively modest space in their daily lives. In an era that is characterised by rapid technological evolution, various tools have emerged to simplify and streamline diverse facets of existence. VT has emerged as a transformative force, rendering a multitude of activities more accessible and hygienic. Its ability to minimise the necessity for physical interaction has become especially relevant in our ongoing battle against the persistent spectre of the COVID-19 virus. The culmination of this study resonates with the resounding message that VT is a beneficial and transformative force in human affairs. By harnessing the potential of VT, students can embark on a journey teeming with enriching experiences, ultimately attaining a profound level of satisfaction.

The study's focus on undergraduate students is particularly relevant to Malaysia, as it helps to understand the readiness of the undergraduate students to embrace VT. However, certain challenges were encountered during the research process, such as limited access to high-quality VT experiences and the need for greater awareness among potential users. These obstacles highlight the importance of addressing infrastructure and awareness issues to promote VT adoption effectively.

Malaysian tourism can leverage these insights to engage with and attract younger tourists, who are likely to be early adopters of VT experiences. To further advance the understanding of VT's adoption in Malaysia, future research can delve into exploring strategies for enhancing access to VT content, as well as conducting in-depth studies on the factors influencing the adoption and satisfaction levels among different demographic groups. In conclusion, the promising trajectory of VT, as illuminated by this study, underscores its potential to reshape the future of the tourism industry. As the world continues to grapple with the enduring presence of the pandemic, VT emerges as a beacon of hope, offering not only a safe and hygienic alternative but also a gateway to a new era of travel and exploration. The journey ahead holds great promise, as VT paves the way for more immersive, efficient, and satisfying tourism experiences, breathing new life into the industry and rekindling the spirit of adventure in the hearts of travellers worldwide.

5.1 Limitations and Future Agenda

One limitation of this study is that the conceptual ideas and structure of VT proposed in this paper have not yet been empirically tested in practical applications. Given the rapid and complex evolution of market forces, especially in the realm of new technologies, this study may appear somewhat futuristic. However, it is crucial to acknowledge that the development and implementation of VT may face practical challenges that were not addressed in this theoretical framework. Another limitation lies in the model's focus on perceived benefits and perceived sacrifices as predictors of behavioural intention, without considering the mediating role of perceived value. Future research should explore how perceived value mediates the relationship between the benefits and sacrifices associated with VT adoption and students' intentions to engage with VT. This can provide a more nuanced understanding of the decision-making process. The study did not distinguish between senior and non-senior individuals in the context of travel preferences and VT adoption. Research by Mohamed et al. (2016) suggests that there are differences between these cohorts in travelling preferences. Therefore, future investigations should consider the inclusion of both senior and non-senior demographics when examining VT adoption. Failing to do so could result in an overly abstract understanding of VT's relationship with behavioural intention.

5.2 Future Agenda

Future research should aim to test empirically the conceptual framework of VT proposed in this study in real-world scenarios. This empirical validation can provide valuable insights into the practical challenges and opportunities associated with VT adoption in the context of the rapidly evolving technological landscape. To gain a more comprehensive understanding of VT adoption, researchers should investigate the mediating effect of perceived value between perceived benefits and perceived sacrifices regarding behavioural intention. This research can uncover the underlying psychological processes that drive individuals' decisions to embrace VT. Recognizing the differences in travel preferences between senior and non-senior individuals, future studies should adopt a more inclusive approach. By considering the unique needs and preferences of both cohorts, researchers can develop targeted strategies for promoting VT adoption across a wider range of potential users.

In conclusion, while this study lays the foundation for understanding VT adoption and its relationship with behavioural intention, it also highlights several limitations that open doors for future research. Addressing these limitations through empirical validation, exploring the mediating role of perceived value, and accounting for diverse demographic groups can contribute to a more comprehensive and practical understanding of VT's role in the digital age.

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APPENDIX

Table 1: Students' Demographic

Demographic	Sample Size (n = 306)	Percentage %
Gender		
Male	132	43.14
Female	174	56.86
Age		
Below 19	6	1.96
20 – 25	290	96.73
Above 25	10	3.27
Year		
First Year	46	15.03
Second year	82	26.80
Third year	178	58.17
Marital		
Single	286	93.46
Married	18	5.88
Divorce	2	0.65
Travelling Frequencies		
Twice a year	78	25.49
Every year	172	56.21
Once every 2 years	56	18.30

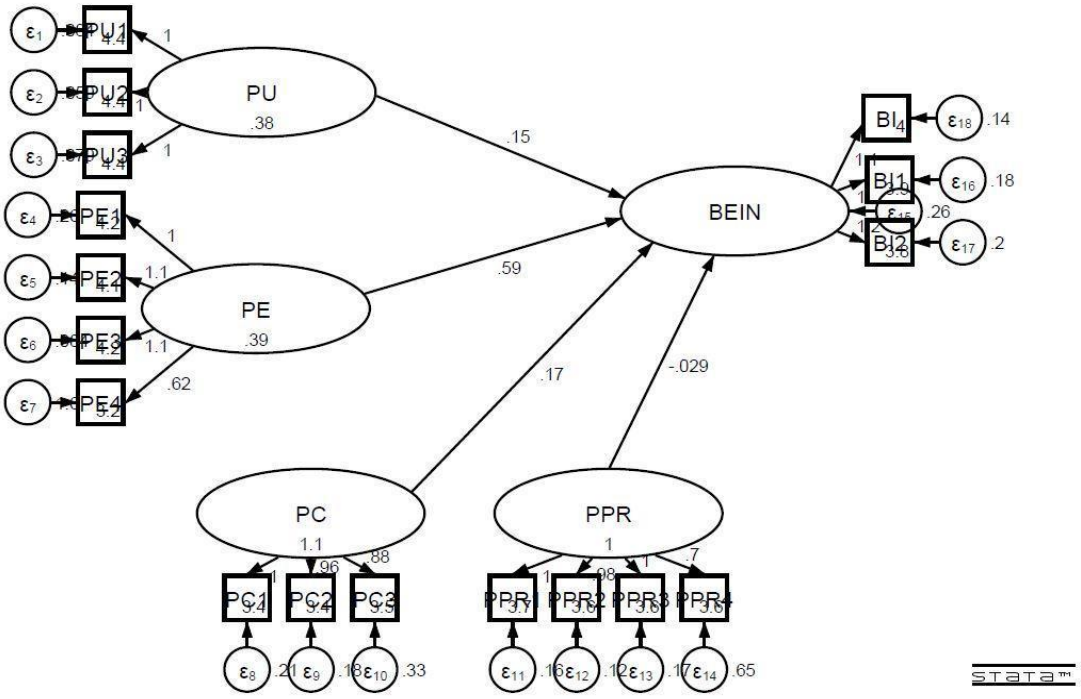

Figure 2: SEM Path Graph