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Research Article

Predicting the actual use of artificial intelligence features of Apple Vision Pro using PLS-SEM

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ABSTRACT

Despite the spread of artificial intelligence (AI) tools and applications, the Apple Vision Pro (AVP) stands out for its innovative features compared to other types of wearable technology. Moreover, traditional glasses have been deficient in incorporating many AI innovations that could enhance user experiences and pose new challenges. In response to these innovative aspects, this study aims to develop a theoretical model by integrating constructs from the expectation confirmation model (ECM) (expectation confirmation and satisfaction [SAT]) and aspects from the Uses and Gratifications (U&G) theory. The perceived human likeness of AI mediates the model. This study focuses on the educational domain, aiming to assess how this technology enhances the academic environment and improves learning outcomes. The method used was a survey distributed among 134 participants from Al Buraimi University College, Oman, for two departments: English, linguistics, and information technology. The study consists of seven hypotheses to emphasize the conceptual model. The findings significantly impact predicting the actual use (AU) of AI features of AVP, indicating that users' expectations and SAT play a pivotal role in technology adoption and are closely linked to the variable human likeness. Similarly, factors such as entertainment value, informativeness, and the lack of web irritations significantly influence technology adoption and are associated with the human likeness variable. However, Informativeness gratification failed to pass the proposal and showed a negative indicator for predicting the AU of AI. The implications drawn from these results suggest that educational institutions should tailor their courses and curricula to promote the effective use of AI.

Keywords: Apple Vision Pro, vision, ECM, U&G theory, human likeness

INTRODUCTION

Apple Vision Pro (AVP) is considered part of the wearable technology that is predicted to form a kind of extension of the human body and mind. AVP is regarded as a bridge between technology and artificial intelligence (AI), where reality and virtual merge because it blends digital content with physical space. Users can navigate simply by using their eyes, hands and voices (Tatnall, 2020). AVP enables users to browse the web, chat in messages, and create a to-do list while staying present in the world around them. The advancements in AVP are tremendous and revolutionizing due to its accessibility features for all users with visual deficits (Alfarsi et al., 2021; Egger et al., 2023; Kim et al., 2012; Yu, 2024).

Previous studies have focused on the impact of AVP in the medical field and on ethical challenges. These studies have deeply investigated the effect of AVP, aiming to evaluate the accuracy of computer vision systems and computer applications to facilitate the flow of information in harvest time and allow for better results. Other studies have put other purposes, including transitioning wearable technology from augmented reality (AR) to virtual reality (VR), examining the application and utilization of AVP in medical centers, evaluating the precision of computer vision systems and applications in streamlining information flow during harvest time, and analyzing the evolving discourse concerning its application in healthcare and medical education (Adamopoulou & Moussiades, 2020; Almogren et al., 2024; Al-Rahmi et al., 2023; Chen & Wells,1999).

Previous studies have predominantly emphasized the significance of utilizing AVP, with varying objectives. To the best of our knowledge, no study has tackled the adoption of this technology at the educational level by a group of students in the gulf area to investigate the impact of using this technology in the educational field for academic and entertainment purposes (Walsh & Yamin, 2005). This study seeks to explore the effects of AVP glasses on students and fill the knowledge gap in this field. The current study attempts to investigate the impact of AVP based on a conceptual model. The conceptual model comprises two theories, uses and gratifications (U&G) and expectation confirmation model (ECM), with the mediating factor of human likeness to measure the effectiveness of AVP in the gulf area. The strength of the current theory lies in its ability to predict not only the immediate attention to use the technology but also measure the intention to use the AI technology based on a conceptual model that tends to indicate the individual's continuous intention of usage.

AVP is considered deviant from other technologies. A simple comparison between AVP and Google Glass leads to apparent considerations. First, the display technology of AVP features high resolution with eye tracking, hand gestures, and voice commands. On the other hand, Google Glass offers a high-resolution AR display with a touchpad and voice commands. Second, AVP has fruitful applications in terms of entertainment, education, and productivity, whereas Google Glass is effectively used in manufacturing and healthcare. Third, AI applications are integrated into AVP for advanced machine learning and contextual awareness; however, Google Glass has more restricted uses, focusing on AI-driven applications for business (Alfarsi et al., 2021; Egger et al., 2023; Rehman & Cao, 2016).

This study deviates from previous research in two significant ways. First, it aims to investigate students' attitudes by employing a conceptual model designed explicitly for this purpose. It is an adoption study emphasizing students' desire to use AVP for educational purposes. Second, it is the pioneering study to propose a conceptual model for examining the adoption of AVP. The key variables of this model have not been used in prior research to explore students' attitudes towards using AVP in an educational setting. Most previous studies have concentrated on the medical field and other domains, with less emphasis on educational environments.

Based on the previous assumption, the current study aims to investigate the role of AVP as a learning facilitator, assessing how this technology enhances the educational environment and improves learning outcomes. Assuming that the impact of technology can be shaped by using influential factors, the study seeks to investigate the effect of AVP on students' technology adoption. Key factors are the emotional aspect of engagement, students' emotion of gamification, sense of human likeness, entertainment value and other crucial factors.

This study is divided into several sections. The first section explained the existence of studies that related to the research title and almost used the critical factors. The second section presents the theoretical work of the two models and the features of each factor to enhance the actual use (AU) of AI features of AVP (Walsh &

Table 1. Summaries of previous studies for AVP

Reference	The purpose of the study	Field of study
Almogren et al. (2024)	The study aims to investigate the effect of AVP glasses that transfer this wearable technology from augmented reality to virtual reality.	The effectiveness of certain AVP features in health care.
Kim et al. (2012)	It aims to evaluate the accuracy of computer vision systems and applications to facilitate information flow during harvest time.	Agriculture focuses on the relationship between harvest and computer vision
Yu (2024).	The study aims to analyze the emerging discourse surrounding AVP's application in healthcare and medical education.	The relation between AVP, augmented reality, and spatial computing in health care shows a positive significance of the results.
Egger et al. (2023)	The study aims to develop an accurate data capture approach based on a vision sensor proposed.	The importance of using pro vision appears in smart manufacturing.

Yamin, 2005). The third section included data collection of the targeted participants and the research method to develop the conceptual model that examined the impact of each hypothesis proposed and its correlation effect for the whole model. Then, a discussion section uses a partial least squares structural equation modeling (PLS-SEM) program to evaluate the developed model's accuracy, reliability, and validity (Tawafak et al., 2023a). Finally, a limitation section determined the missing parts of the study and the research conclusion in the parts that gave significant support. A recommendation section for any improvements could be added or tested to make this study more efficient and continuously accepted, along with any additional predictions of the AU of AI features of AVP.

LITERATURE REVIEW

Due to the recent introduction of AVP wearable technology and its high cost, studies examining its effectiveness are relatively few. AVP is distinguished by its unique vision screening capabilities, which connect users to an extended reality without requiring specialized equipment. Earlier research explored the impact of AVP features across diverse fields, including agriculture, healthcare, and smart manufacturing. However, recent studies predominantly focus on its application within medical centers, highlighting the most influential features that enhance the medical environment (see **Table 1**). For instance, Almogren et al. (2024) examined AVP usage in health centers, emphasizing its significant transition from AR to a near-VR experience, free from spatial limitations. Similarly, Yu (2024) and Alfarsi et al. (2020) explored the impact of AVP applications on medical health centers, demonstrating their potential to transform technology usage in this setting. Other studies have investigated AVP's vision capabilities in fields like agriculture, where its system accuracy can drive significant advancements (Adamopoulou & Moussiades, 2020). In the realm of smart manufacturing, Egger et al. (2023) addressed the substantial influence of an advanced vision system on manufacturing processes. **Table 1** provides an overview of previous studies referenced in the literature review.

Even though these studies exist and have well-mentioned terms and factors, they still failed (Ullah et al., 2024) despite theories and some deficiencies of factors. The central part is that previous studies still have not covered the model development nor the combined items to improve the model validity and test a significant impact (Tawafak et al., 2023a).

The effectiveness of AVP, a wearable technology, has been explored in limited studies due to its recent introduction and high cost. Early research investigated its utility across various sectors, including agriculture, healthcare, and smart manufacturing (Tawafak et al., 2023b). However, recent studies predominantly focus on its application in medical centers, emphasizing its influential features that enhance medical processes. For example, Almogren et al. (2024) highlighted AVP's transition from mixed, AR to a VR-like experience without spatial limitations in healthcare settings. Similarly, Yu (2024) analyzed the impact of AVP applications on medical centers (Dahri et al., 2024).

In addition, the advancements in AVP hold tremendous potential for revolutionizing accessibility for individuals with visual deficits. The combination of exceptional 4K displays per eye and high brightness levels can significantly enhance the visual experience for these users. For instance, AVP can significantly aid those with night blindness (nyctalopia), a condition characterized by the eye's failure to adjust from photopic (light) to scotopic (dark) conditions (Alfarsi et al., 2020; Eighmey & McCord, 1998; Tawafak et al., 2023b).

Studies in other fields, such as agriculture, have examined AVP's potential, focusing on the accuracy of its vision system to drive advancements. Egger et al. (2023) explored the impact of precise vision systems in smart manufacturing, noting how these developments could significantly influence the field.

Based on the previous assumption, the following sections focus on introducing the most critical variables in the conceptual model to help formulate hypotheses.

THEORETICAL FRAMEWORK

This study endeavors to develop a conceptual model that explores the adoption of innovative technology. The novelty of technology motivates researchers to construct this conceptual framework. Moreover, this study focuses on the educational domain, aiming to assess how this technology enhances the academic environment and improves learning outcomes (Ajzen, 1991).

Due to its innovative features, the study has connected AVP with the educational environment. The following are examples. First, the video see-through capability of AVP transforms it into an AR device, which enhances students' experiences in various majors. For instance, biology students can visualize complex anatomical structures directly on a physical specimen, deepening their understanding through interactive exploration. Second, AVP has innovative features such as the inside-out screen, which can display the headset wearer's eyes to "outsiders." This feature fosters a more inclusive and interactive learning environment. This feature may allow engagement in a more effective learning environment. For example, during collaborative activities, instructors can maintain eye contact with students, enhancing communication and fostering a sense of connection, even while using the headset (Bhattacherjee, 2001).

The current study diverges from previous research in two significant ways. First, it examines students' attitudes using a tailored conceptual model designed for this purpose, emphasizing their inclination towards using AVP for educational purposes. Second, it pioneers the proposal of a conceptual model for investigating the adoption of AVP. The key variables in this model have not been previously explored in studies examining students' attitudes towards AVP in educational settings. Previous research has predominantly focused on medical and other domains, with limited attention to academic environments.

The U&G Theory

The U&G theory is based initially on the impact of users' motivation and concerns to use technology, seeking to focus on the role of the individual users as active users. Therefore, the theory is mainly concerned with understanding users' psychological needs, which shape people's reason for using the technology and motivate them to engage in certain media use behaviors for gratifications that fulfil their inherent needs (Adamopoulou & Moussiades, 2020; Al-Rahmi et al., 2023). The study is based on the integration of traits from ECM and U&G theory, as well as AVP for educational purposes. The core reason behind the model is the feature of AVP, a VR device with an additional video see-through capability that creates practical opportunities for entertainment. The entertainment factors embedded in the U&G theory are linked with features of AVP due to its video see-through capability turns. AR features are enabled by streaming the real world via cameras on the VR screens in front of the user's eyes (Egger et al., 2023; Rehman & Cao, 2016). Accordingly, the following hypothesis is formulated:

Entertainment gratification

Entertainment gratification (EG) is where technology users can explore entertaining elements to attract attention. A well-structured and attractive world of virtual communication will offer new opportunities to persuade users to be interested in adopting the technology. The motivation that arises from using EG provides users with a fun and entertaining web structure, which pleases them and motivates them to use technology more often (Chen & Wells,1999; Gonzalez Nieto et al., 2023). The entertainment dimension in the current theory emphasizes the value of media entertainment lies in its ability to fulfil users' needs for escapism, hedonistic pleasure, aesthetic enjoyment, or emotional release (Lim & Ting, 2012). The higher the level of entertainment is, the higher the perceived value by users leads to an advantage for users, motivating them to use technology more frequently (Wu et al., 2020). Following the previous stream of research, the following hypothesis is proposed:

H1: Entertainment is positively associated with the perceived human likeness (PH).

Informativeness gratification

Informativeness gratification has a close relation with the extent to which the technology provides users with resourceful and helpful information to users. It is at the core of the gratification theory (Ullah et al., 2024). The flow of information and the amount of information that a user can receive during their experience with technology could cause some confusion, which may lead to dire consequences. In this respect, Lim and Ting (2012) states that confusion is related to too many, too similar, or ambiguous information stimuli, which will prevent users from fully understanding and processing the information with a high level of confidence because of the complexity of the situation and inability to process and manage all alternatives. This dimension, in theory, is distinguished from the entertainment one because it focuses on receiving information that should be classified as resourceful and helpful. The higher the ability to provide users with accurate and required information, the higher the level of acceptance towards technology (Tawafak et al., 2023a; Waisberg et al., 2024; Wu et al., 2020). Therefore, users use technology to gather various types of information. Accordingly, the following hypothesis is formulated:

H2: Informativeness gratification is positively associated with PH.

Web irritation

The irritation gratification is closely related to the irritation caused by technology, which can be described as too messy (Tawafak et al., 2023c). The irritation gratification is due to the unclear vision that users may face when using technology, specifically when the related information can be classified as unrelated (Chen & Wells,1999; Ullah et al., 2024). The irritation stems from the fact that users may feel isolated from the outer world, leading to so-called human anxiety, which distracts users' attention and dilutes human experiences. Furthermore, irritation could have more serious consequences when it is connected with the perceived value to the audience. In other words, when the information is perceived as unwanted or messy, negative influences may be noticed (Waisberg et al., 2024; Wu et al., 2020). As such, the following hypothesis is formulated:

H3: Web irritation (WI) is negatively associated with PH.

The Perceived Human Likeness

Using human likeness implies that technology can accomplish what a human can do depending on AI technology, which is not restricted to humanlike features but also has some functions to interact with human beings. AI has capabilities commonly thought to be like human intelligence. Virtual agents that are targeted to behave or act like humans are engaged in verbal interactions with human beings, which makes conversations smooth and the flow of information attainable (Rahi et al., 2023; Rubin, 2009). With the experience of VR, the use of human likeness features is highly evident, opening the space in front of different usage of avatars that can behave similarly to humans (Rahi et al., 2023). PH in the educational environment dramatically impacts students' motivation. The design of eye movement and other facial features that enable students to interact with humanlike agents increases the level of motivation and can be used for a wide range of communication. Interaction with educational tools exhibiting humanlike characteristics can enhance conversational skills and strengthen emotional connection. This connection can lead to increased engagement and a greater willingness to participate in learning (Ebadi & Rahimi, 2024; Ruijten et al., 2015). The high perceived naturalism of avatars that tend to have naturalistic behavior will affect adopting technology. Based on the previous assumption, the following hypothesis is proposed:

H4: Human likeness is positively associated with the use of AVP.

Expectation-Confirmation Model

ECM has affected the expectations and perceived expectations that may lead to a level of satisfaction (SAT) a user can perceive. ECM can create negative and positive effects to measure the relationship between performance and expectations (Rahi et al., 2023). The strength of the current theory lies in its ability to predict not only the immediate attention to use technology but also measure the continuance of usage by predicting and explaining the individual's continuous intention of IT usage: SAT, confirmation of expectations, and perceived usefulness. What is deeply rooted in expectation-confirmation theory is how it influences users'

decisions to continue using the technology based on the fact that it provides the user with the required level of SAT and confirms their expectations and perceived usefulness (Santos & Castillo, 2024; Tawafak et al., 2023c). TAM confirmation is "the realization of expected benefits from IS use" (Walsh & Yamin, 2005). Perceived usefulness refers to the extent to which technology users grasp the technology as being beneficial. Concerning Santos and Castillo (2024), when users are satisfied with the technology, they use it more frequently. This explains why user SAT is associated with the complete assessment of the technology itself, where user SAT is the critical source of acceptance. Users' SAT has an intrinsic relation with motivation that may result in the use of technology (Mun et al., 2006; Obeid et al., 2024). Accordingly, the following hypothesis is proposed:

H5: ECM is positively associated with PH.

Intention to Use Technology

The current study considers the intention to use technology as a dependent variable because of its close link to actual behavior. The focus of the exact behavior attention is significantly important because it is the factor that captures how hard people are willing to try to perform a behavior. One of the advantages of using the actual intention to use the technology is its practical consequences of using and accessing the provided information (Obeid et al., 2024; Prasetya et al., 2022). As such, the following two hypotheses are formulated:

H6: U&G is positively associated with the use of AVP.

H7: ECM is positively associated with the use of AVP.

As such, the following sections are devoted to the study's practical aspects, focusing on the data collection and methodology implemented to achieve practical results that may raise both practical and managerial recommendations.

DATA COLLECTION

This study used a survey designed through Google Forms and distributed among the Al Buraimi University College, Oman (BUC) students. The selected samples were used from all departments in the college where the researchers worked and handled their students in the classes. The total number of dedicated students was more than 200; only 134 participants filled out the survey with full-item sections included. The participants approved that their information would stay secret and ambiguous. Also, they obtained informed consent from all participants, emphasizing transparency and voluntary participation in the study. The number of participants allowed for this study was tested using the G-power program, and the program shows that the 125 sample is the accepted target to conduct the survey. Furthermore, this study is limited to one university where the researchers work, and they aim to check whether Oman can be an ideal model for the Gulf country if the model is significantly accepted. Then, the study will be expanded to include more universities and countries.

This information collection comprises data from 134 members over different socioeconomics and characteristics. **Table 2** shows the demographic information of the participants.

Table 2 shows the demographic gender, and it appears that 64.2% of the members are recognized as female. Age-wise, a noteworthy parcel, bookkeeping for 60.4%, falls inside the bracket of 18 to 22 a long time ancient, whereas 11.9% are over 30 a long time ancient. Regarding departmental representation, 46.3% are associated with the IT segment. For instructive fulfilment, the more significant part, constituting 69.4%, holds bachelor's degrees. Nationality-wise, to an overwhelming extent, 94% hail from Oman. In conclusion, roughly 59.6% of the members have a medium level of information regarding abilities advancement. **Figure 1** shows the demographic details.

Table 2. Demographic information

Type	Categories	Percentage (%)
Participants	BUC student	100
Gender	Female	64.2
	Male	35.8
Age	18–22	60.4
	23–30	27.6
	Above 30	11.9
Department	IT	46.3
	Law	16.4
	Business	10.4
	English	22.4
	Foundation	4.5
Degree	Diploma	26.1
	High diploma	4.5
	Bachelor	69.4
Nationality	Omani	94.0
	Others	6.0
Computer skills	Low	11.2
	Medium	59.7
	High	29.1

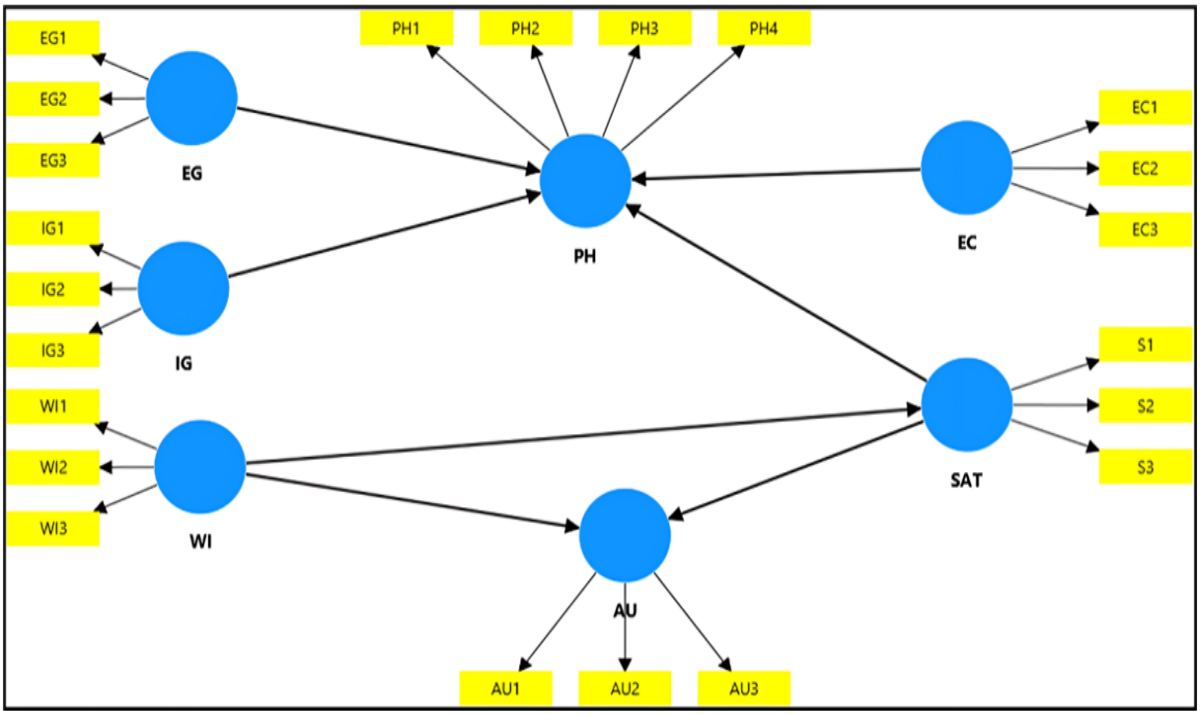

Figure 1. Research model using PLS-SEM (items and relationships) (the authors' own work)

RESEARCH METHOD

Research Strategy

The chosen strategy for anticipating the unaffected utilization of false vision highlights of Apple glasses includes a comprehensive comparative consideration utilizing PLS-SEM and different machine learning calculations (see **Figure 1**, the theory proposed model).

Table 3. The survey items definition and questionnaire used for each variable

Variable	Definition/reference	Questionnaire
EG	Entertainment construct refers to the extent to which the technology has a high degree of fun and is entertaining to its users (McQuail,1987).	EG1: The Apple Glass boasts innovative, fun AI-powered features. EG2: The AI features in Apple Glass are used for entertainment purposes. EG3: I prefer using Apple Glass because of its entertaining AI features.
IG	The informativeness construct refers to the extent to which the technology-connected media provides users with resourceful and helpful information to media users (Prasetya, 2022).	IG1: The information I receive while using Apple Glass is assisted by AI features. IG2: The information is enhanced by the utilization of AI. IG3: I prefer using Apple Glass because of its informative AI features.
WI	The web irritation construct refers to the extent to which the web is messy and irritating to media users (McQuail,1987).	WI1: The AI web-based info in Apple Glass is messy and confusing. WI2: The AI web-based info irritates me. WI3: The usage of AI resources has limitations.
PH	Human likeness involves the responses to a humanlike entity's features. The human likeness perception can be identified by how consumers perceive the reality of the humanlike entity's features (Masalkhi, 2023).	PH1: The AI features in Apple Glass have humanlike, entertaining characteristics. PH2: The AI features in Apple Glass transport me to the real world. PH3: I prefer using Apple Glass because of its humanlike features, meeting my expectations. PH4: The humanlike AI features satisfy my needs.
EC	Expectation-confirmation refers to "users' perceptions of the congruence between the expectation of information system usage and its actual performance" (Santos, 2024).	EC1: My experience with AI in Apple Glass exceeded my expectations. EC2: The AI features beat my expectations. EC3: Overall, most of my expectations were met.
SAT	Satisfaction is defined as "the affective attitude towards a particular computer application by an end user who interacts with the application directly" (Walsh & Yamin, 2005)	S1: I am satisfied with the AI features in Apple Glass. S2: I am satisfied with the AI guidance. S3: I have a positive attitude towards the AI features in Apple Glass.
AU	It is defined as "users' intention to continue using the information system" (Santos, 2024)	AU1: I will use Apple Glass daily because of its entertaining and informative AI features. AU2: I will use Apple Glass frequently because its AI features meet my expectations. AU3: I will use Apple Glass because of its satisfying AI features.

Research Factors

As the study explained in the literature review section, this study developed to include the following factors: EG of three items, information gratification (IG) with three items, WI included three items, PH with four items, expectation confirmation (EC) of three items, SAT of three items and AU included three items (Mun et al., 2006).

Proposed Research Model

Figure 1 shows PH variable effected by the two standard models, U&G theory and ECM model. It also shows the impact of these two models on the AU of AI feature variables. **Table 3** explains the definitions of each factor and the survey items related to each part of these factors (Oliver, 1980).

In this study, the proposed model is developed based on PLS-SEM application, which was utilized to draw out essential constructs based on the structural relationship analysis between measured variables and latent constructs (Pikhart et al., 2022).

Research Design and Objectives

Characterize the investigated destinations: Verbalize the reason for foreseeing the actual utilization of AI highlights in Apple glasses (see **Table 3**). **Table 3** illustrates the definition of the survey items, the references, and the questionnaire used for each variable in the survey form link.

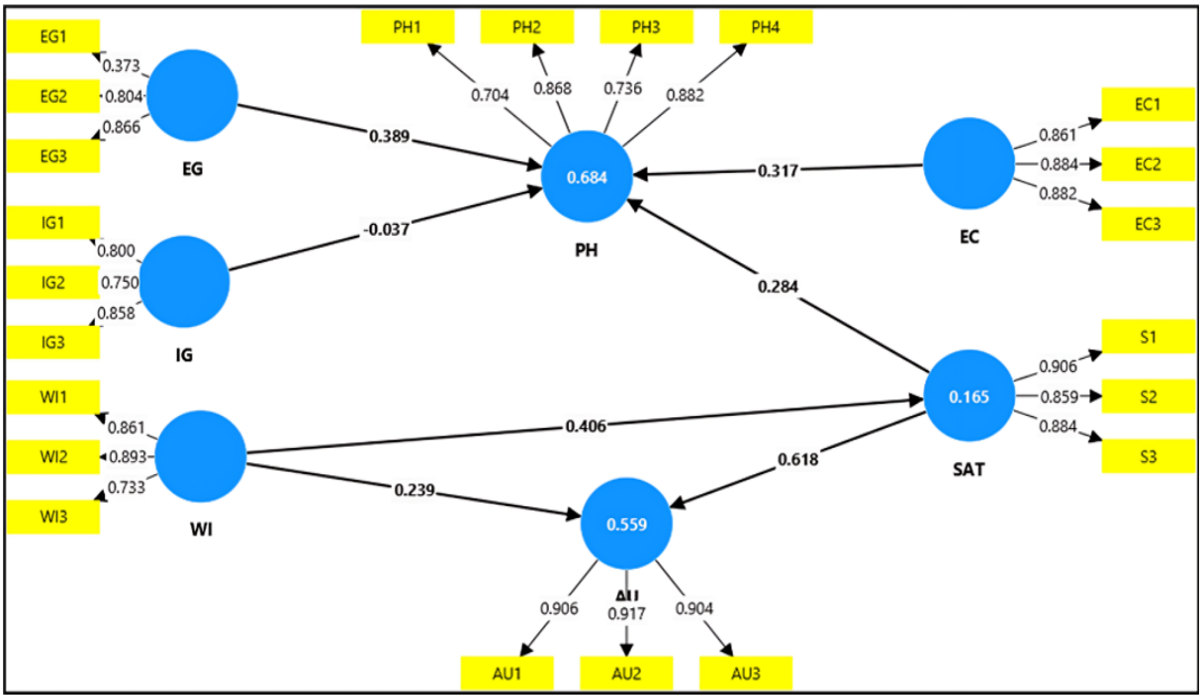

Figure 2. Research model values (the authors' own work)

Research Hypothesis

This section developed the hypothesis derived from the literature review and the gap missed in these studies to develop this current study hypothesis.

Define investigating questions

Create particular questions about the components impacting the appropriation of AI highlights.

Survey existing writing

Investigate past ponders on innovation appropriation, AI utilization, wearable gadgets, and components impacting client behavior.

Distinguish hypothetical systems

Select important hypotheses or models (e.g., innovation acknowledgment demonstrate, bound together hypothesis of acknowledgment, and utilize of Innovation) as the premise for investigation.

This study proposed the following hypotheses:

H1: In interactive media, there is a positive relationship between EG and PH.

H2: In interactive media, there is a positive relationship between IG and PH.

H3: In online interactions, there is a positive relationship between WI and PH.

H4: There is a positive relationship between EC and PH in online interactions.

H5: A positive relationship exists between SAT derived from ECM and PH in human-computer interactions.

H6: There is a positive relationship between U&G theory and the AU of AI features.

H7: There is a positive relationship between the ECM model and the AU of AI features.

Figure 2 shows the total results of the proposed hypotheses and the values needed to support these connections.

Table 4. Path coefficients

Factor	AU	PH	SAT
EC	X	0.317	X
EG	X	0.389	X
IG	X	–0.037	X
SAT	0.618	0.284	X
WI	0.239	X	0.406

DATA ANALYSIS

PLS-SEM

Utilize PLS-SEM to evaluate the connections between idle builds and anticipate the genuine utilization of AI highlights. This strategy permits the synchronous examination of estimation and basic models (Malik et al., 2021).

This section provides data analysis and discusses using the developed model. This part will discuss the type of value achieved from the model using the PLS-SEM program.

Path Coefficient

Table 4 shows the path coefficient values for each variable and its impact on the other variables depending on the relationship proposed in the research model. The path coefficient is considered a significant result and accepted positively when all the coefficients exceed 0.2. As explained in **Table 4**, all values are correctly accepted unless they look weakly accepted in each case (Lim, 2015). However, the final values of the testing model were assigned as supported and significant for most parts of the model paths. The failed path came in the path coefficient between IG and PH, where the value is –0.037.

However, this negative path coefficient does not impact the total R-square (R^2) achieved from PH even though it indicates that one failed path cannot change the significance of the model construction and its values (Luo, 2002). **Table 4** included *x* value to represent the empty influence between the crossed variables, where these variables were defined as independent and no arrows were used to connect them in the designed model.

Outer Loading Items

Table 5 demonstrates the outer loading for each item used in the survey and how it is used in positive values during the PLS-SEM calculations connected to each variable. As shown in **Table 5**, all the outer loading values are above 0.7, which indicates keeping all the items proposed in the survey without excluding any negative values (Lim, 2015).

Cronbach's Alpha

Table 6 shows the values of Cronbach's alpha, rho-A, composite reliability (CR) and average variance extraction (AVE). The standard accepted value for Cronbach's alpha should be equal to or greater than 0.7. Furthermore, CR should be greater than 0.7 to be acceptable. Besides, the accepted value for AVE should be greater than 0.5, as suggested by Kumar and Natarajan (2020) and Al-Maroof et al. (2024).

Table 6 values are mostly significant acceptable results. All the checkpoints used are fitted with the standard regulations and show an effective positive response that was achieved from the data analysis of the survey feedback. The lack of results failed with Cronbach's alpha with EG factor, while CR and AVE are accepted values.

Convergent Validity and Discriminant Validity

Furthermore, in testing the validity of the model constructs, two measures were considered, which are convergent validity and discriminant validity, where the convergent validity was employed to assess whether items within the same construct were highly correlated with each other, as shown in **Table 7**. On the other hand, discriminant validity was used to determine if the items loaded more on their intended construct than on other constructs (Tawafak et al., 2023a). Therefore, construct validity was tested using factor analysis with

Table 5. Outer loading

	AU	EC	EG	IG	PH	SAT	WI
AU1	0.902						
AU2	0.919						
AU3	0.901						
EC1		0.850					
EC2		0.901					
EC3		0.894					
EG1			0.756				
EG2			0.765				
EG3			0.841				
IG1				0.824			
IG2				0.728			
IG3				0.881			
PH1					0.824		
PH2					0.902		
PH3					0.701		
PH4					0.893		
SAT1						0.911	
SAT2						0.843	
SAT3						0.899	
WI1							0.879
WI2							0.893
WI3							0.827

Table 6. Construct reliability and validity

	Cronbach's alpha	Roh-A	CR	AVE
AU	0.895	0.898	0.934	0.826
EC	0.849	0.856	0.908	0.767
EG	0.551	0.667	0.740	0.512
IG	0.749	0.845	0.845	0.646
PH	0.811	0.836	0.877	0.642
SAT	0.860	0.871	0.914	0.780
WI	0.778	0.808	0.870	0.692

Table 7. Fornell Larcker criterion discriminant validity

	AU	EC	EG	IG	PH	SAT	WI
AU	0.907						
EC	0.728	0.882					
EG	0.558	0.585	0.788				
IG	0.558	0.684	0.643	0.813			
PH	0.702	0.730	0.670	0.628	0.834		
SAT	0.736	0.762	0.507	0.793	0.673	0.885	
WI	0.467	0.445	0.440	0.244	0.529	0.310	0.867

principal component analysis and varimax rotation. The diagonal line of loading between 0.45 and 0.54 is generally considered fair, loading between 0.55–0.62 is good, loading between 0.63–0.70 is very good, and loading is considered excellent if it is higher than 0.71 (Prasetya et al., 2022). The modified factor loading analysis indicated that all the model constructs have good convergent and discriminant validity, with each AVE value more significant than the threshold value, as presented in **Table 7**.

R^2

However, the model aims to validate each hypothesis based on the survey data employed using PLS-SEM, which supports the analysis of the relationships between the constructs (independent and dependent factors). The test of the structural model included measuring R^2 values, which represented the amount of variance explained by the independent factors, and estimates of the path coefficients, which indicate the strengths of the relationships between the dependent and independent factors (Al-Maroof et al., 2024; Rahi et al., 2023). Thus, R^2 and the path coefficient values were examined to indicate how well the data supported

Table 8. R^2

	R^2	R^2 adjusted
AU	0.559	0.596
PH	0.684	0.630
SAT	0.165	0.087

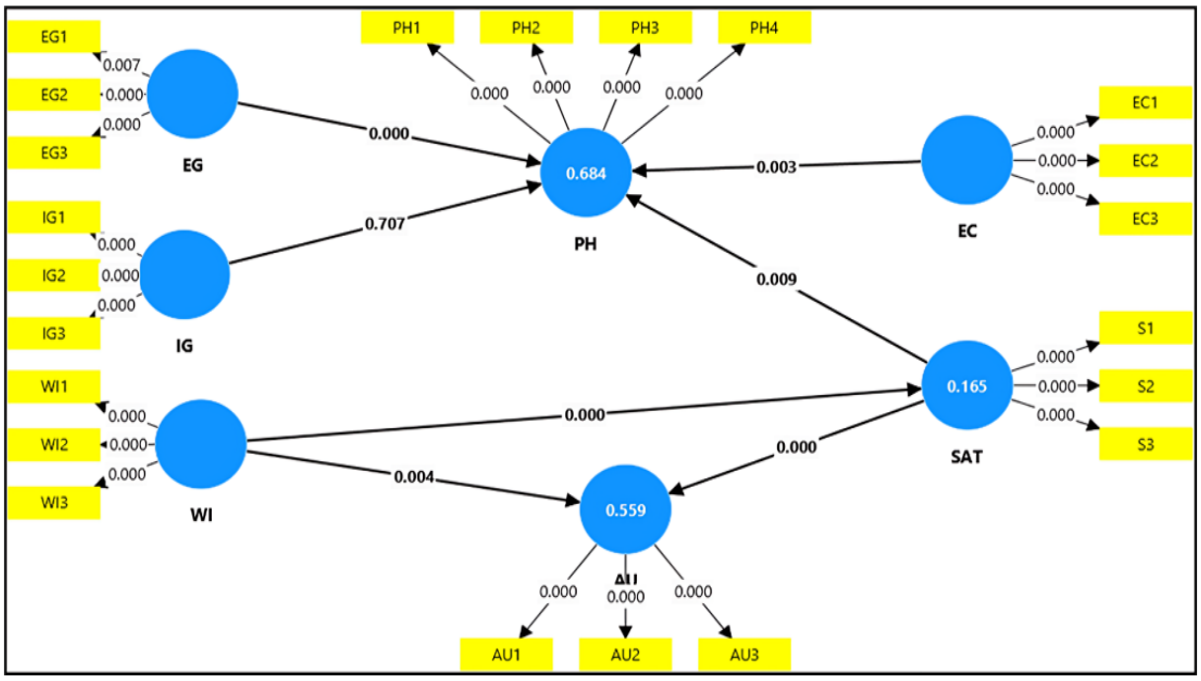

Figure 3. Bootstrapping research model values (the authors' own work)

the hypothesized integrated model, as shown in **Table 8**. According to this model, **Table 8** with R^2 started with 0.559 and 0.684 as firmly accepted values from the main variables of AU and PH, respectively. SAT has weak acceptance as an independent variable.

MODEL ASSESSMENT AND COMPARISON

Assess PLS-SEM Demonstrate

Evaluate the goodness-of-fit files (e.g., R^2, goodness-of-fit record) to decide the model's illustrative control and prescient capability. Assess machine learning models: Utilize measurements such as precision, exactness, review, and F1-score to assess the execution of machine learning calculations (Kumar & Natarajan, 2020).

Compare Comes About

Compare the prescient precision and informative control of the PLS-SEM demonstrated with the machine learning models to recognize the foremost successful approach for anticipating AI features' genuine utilization (Al-Maroof et al., 2022).

p-Value

By taking this methodological approach, researchers can conduct a thorough and comparative ponder to anticipate the actual utilization of AI features in Apple glasses. This will yield profitable bits of knowledge for partners and contribute to the progress of wearable innovation inquiry. **Figure 3** shows the bootstrapping research model values and the results to calculate the p-value, as explained in **Table 9**.

Table 9. Path coefficients

Hypothesis	Original samples	Sample mean	SD	T-value	p-value	Remarks
EC → PH	0.355	0.326	0.137	2.601	0.010	Supported
EG → PH	0.368	0.371	0.088	4.188	0.000	Supported
IG → PH	–0.059	–0.022	0.134	0.440	0.660	Unsupported
SAT → AU	0.654	0.653	0.083	7.895	0.000	Supported
SAT → PH	0.262	0.259	0.153	1.719	0.086	Unsupported
WI → AU	0.264	0.260	0.087	3.019	0.003	Supported
WI → SAT	0.310	0.312	0.113	2.744	0.006	Supported

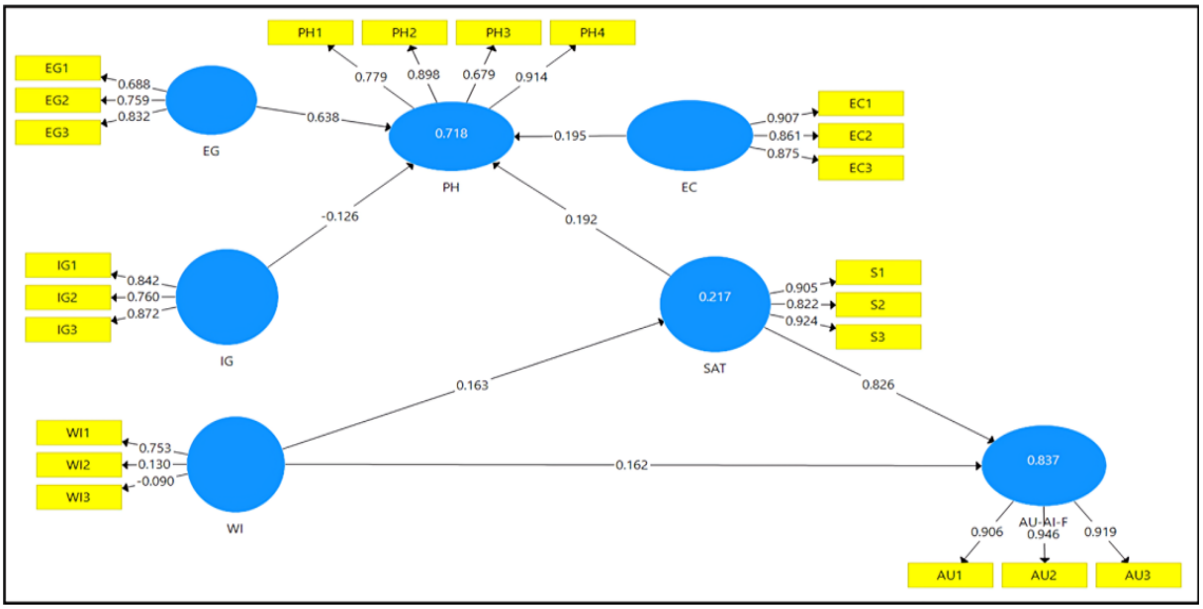

Figure 4. POS (the authors' own work)

Table 10. POS-path coefficient

Factor	AU	PH	SAT
EC		0.195	
EG		0.638	
IG		–0.126	
SAT	0.826	0.192	
WI	0.162		0.163

Mean and Standard Deviation

Table 9 explains the original sample values, the achieved mean, standard deviation (SD), the tested value (T-value), the p-value and the remarks on using this model and these relationships (Fornell & Larcker, 1981). **Table 9** shows five supported relationships and hypotheses. On the other side, **Table 9** shows two unsupported results for the relationship between IG to PH and SAT to PH because their p values are not equal or less than 0.001. For a deep analysis of the results, PLS-SEM program runs within the bootstrapping level to discover histogram impacts (see **Figure 3**).

In another deep calculation, the same model uses production-oriented segmentation (POS) (see **Figure 4**) to test if path coefficient values are still accepted and if the R^2 values also give strong acceptance if the target variable of AU to AI features is above 0.5. **Figure 4** shows POS and its path coefficient are used in each variable.

Table 10 shows that two points passed smoothly when POS was used in the model. These two acceptable results come from EG to PH (POS-path coefficient = 0.638) and SAT to AU (POS-path coefficient = 0.826).

DISCUSSION OF RESULTS

This section discusses the outcomes from the acceptance model and its significant support between hypothesis relationships. Through the analysis of the results, it is posited that U&G theory, with its considerable components, yields positive outcomes regarding adopting AVP, both directly and indirectly. Utilizing "human likeness" as a mediator facilitates the indirect impact of wearable technology adoption, mediating the relationship between the U&G theory and actual technology use (Keelson et al., 2024). Consistent with prior research, this study suggests that the effects of entertainment and informativeness are vital in technology adoption, contributing to the beneficial outcomes experienced by users. Indeed, U&G theory engenders a heightened level of motivation, corroborating findings from previous studies. These findings align with the current study, where the features of AVP cultivate an enthusiastic and motivational environment within educational settings. However, specific hypotheses remain unsupported, diverging from previous research findings (Al-Maroof & Al-Emran, 2018; Lin & Huang, 2024; Malik et al., 2022; Park et al., 2021).

Likewise, the application of ECM theory has demonstrated a significant impact on the use of AVP, with its components playing a crucial role in gauging the degree of technology adoption. The ECM model was chosen to augment the study's conceptual framework. The outcomes of the proposed hypotheses and model analysis indicate that these variables influence individuals' intention to persist in technology usage. These outcomes are consistent with prior research findings, illustrating the effectiveness of ECM theory in the adoption of e-learning platforms, which parallels the utilization of AVP in the present study (Al-Maroof et al., 2024; Malik et al., 2022; Rubin, 2009).

Understanding the relationship between user SAT and the interface's PH is crucial for interactive media. This study explores the concept that PH and EG have a positive relationship. Our goal in examining this correlation is to provide insight into how users view interactive media and how it affects their level of engagement and pleasure in general.

The positive speculation is that as people see higher levels of amusement and delight from intelligently produced media, they will likely see higher levels of human resemblance within the characters or substances inside that substance.

Table 9 depicts the path coefficients and p-values for each hypothesis in terms of path analysis. Thus, results from the model validation reveal that the survey data supported 5 out of 7 hypotheses.

The model developed in this study contributes to extending the current body of knowledge in existing literature related to AVP and helps researchers and practitioners better understand user behaviors in AU of AI features and the acceptance model. This research has implications for universities and reveals multiple statistically significant relationships explaining why students choose the acceptance model and intend to use AVP AI features system. Findings from this study extend prior work on the acceptance model by highlighting the importance of achieving all factors used in the model. Besides that, findings from this study suggest that the intention to use of AVP AI system of the model is indirectly determined by the independent factors (Katawetawaraks & Wang, 2011). The acceptance model provides an improved explanation and in-depth insights for students regarding their intention actually to use AI features. Therefore, the results from this study can enhance the understanding of factors that influence students' intention to use AVP AI system.

The findings are consistent with earlier studies emphasizing the function of PH in encouraging engagement and the significance of entertainment value in the user experience where $R^2 = 0.645$ and the p-value = 0.001 from **H1**. The positive association implies that users are more likely to view an interface as humanlike when they experience greater SAT from interactive media. Also, the path coefficient was acceptable, with a significantly accepted impact (0.368). Numerous variables, such as the availability of interactive features, tailored content distribution, and responsive design elements that emulate human contact, can be credited for this.

Ismail et al. (2018) aim to comprehend this phenomenon using the uncanny valley theory and U&G approach as a guide. This study analyzes and conceptualizes six key motivations: novelty, information, entertainment, surveillance, esthetics, integration and social interaction, and looks at followers' engagement with virtual influencers. Additionally, we discovered that most followers believe virtual influencers to be eerily

accurate and fraudulent (Al-Maroof & Al-Emran, 2018). These findings contribute to the knowledge already available on U&G, influencer marketing, and virtual influencers in the age of AI. They also shed light on the uncanny valley's mitigating elements, which have theoretical and practical ramifications (Doll et al., 1998).

An earlier study highlighted the importance of entertainment SAT for the user experience on interactive media platforms. According to Keelson et al. (2024) and Al-Maroof and Salloum (2020), users frequently use entertainment value as their primary source of motivation for involvement, which promotes sustained engagement and SAT (Ducoffe, 1996). Furthermore, there has been interest in the idea of PH, particularly about HCI. Research has indicated that users typically favor interfaces that mimic human traits because they feel more engaged and connected (Waisberg et al., 2024). Still, little is known about the precise interaction between EG and PH in interactive media.

Dahri et al. (2022) results showed that there was no significant link between IG and PH (R^2 = 0.645, p = 0.660), which was contrary to the hypothesis. This suggests that interactive media has no statistically significant correlation between SAT of informativeness and the perception of human likeness (Al-Obaydi et al., 2023). The variance in PH may be explained by other characteristics not included in the research model, as suggested by this study's high coefficient of determination (R^2).

The relationship between usefulness SAT and seen human likeness highlights the perplexing interaction between cognitive engagement, enthusiastic association, and story complexity in forming individuals' recognitions of non-human substances inside media substances (Comrey & Lee, 2013).

The findings cast doubt that IG and PH have a favorable connection in interactive media. The intricacy of user preferences and perceptions may be one reason for this surprising discovery. User pleasure may depend on informativeness fulfilment, but it might not impact how humanlike the interface appears to them. When evaluating an interface's human likeness, users may value specific aspects of interaction, such as usability, aesthetics, or social presence, rather than informativeness.

Furthermore, the lack of significance in the relationship could point to moderating factors affecting the relationship between IG and PH (Waisberg et al., 2024). Users' experience of human similarity may be shaped differently by the interaction of informativeness pleasure with factors including task relevance, user traits, and interface design aspects. These findings affect the design and assessment of interactive media platforms. When designing an interface, developers should take a holistic approach, incorporating several aspects of fulfilment and catering to user preferences beyond informativeness (Ismail et al., 2018).

H4, SAT to AU, the importance of significant relationships shows a significant value of (p = 0.000, and T-value = 7.895) beside R^2 (0.604) to show positive and supported results. The study shows an effective result. On the other hand, the platform's design affected the results nicely.

H5, the hypothesis of SAT impact on PH is unsupported, which pointed to this factor and discovered the majority of its influence on PH. This study gives a supported value where R^2 (0.096) shows a weak impact but is still positive, as the exitance studies mentioned in Kumar and Natarajan (2020). However, the path coefficients are negatively impacted by the contrary value of 0.262 and p-value (0.086)

H6, the active relationship between WI and the AU of AI features were the p-value (0.003) and the path coefficient (0.264).

H7, the remarks of the study supported the relationship between WI and SAT factors, which was p-value (0.006). Even though SAT factor's R^2 still does not have a high score (0.096), the proposed relationship works in the positive ship. It gives a growth value with AVE (0.781), CR (0.901), and Cronbach's alpha (0.836), as mentioned according to Kumar and Natarajan (2020), which suggested that SAT may be included in the research model.

CONCLUSIONS

AVP is a groundbreaking example, poised to revolutionize our interaction with the digital world. AVP has progressively become significant in identifying the factors contributing to predicting the AU of higher education institutions (HEIs). The fast changes produced in the acceptance of AU systems need a response to the factors in the developed theoretical models and merging among important factors. Thus, the initial work

on developed theories and combined models is implemented to have an acceptance model of AVP of AI features in HEIs.

As a bridge between technology and AI, AVP seamlessly merges reality with virtuality, offering users a novel way to navigate and interact with digital content using their eyes, hands, and voices. The accessibility features of AVP are particularly noteworthy, as they cater to users with visual deficits, providing an inclusive experience for all. In conclusion, as wearable technologies evolve and integrate into our daily lives, exploring their potential impact across diverse contexts is crucial. The current study represents a step towards filling the knowledge gap surrounding the adoption and usage of AVP in educational settings, paving the way for future research and innovation in this rapidly advancing field.

Theoretical Implications

By examining the adoption and usage intentions of AVP among students, this research sheds light on the immediate benefits of the technology and predicts some theoretical implications (Al-Maroof & Salloum, 2020). Considering the theoretical frameworks and empirical data, this study contributes to a deeper understanding of how wearable technologies like AVP can shape the future of education and human-computer interaction. The theoretical implications of AVP extend beyond its immediate applications in healthcare and medical education. Its role as a wearable technology that integrates seamlessly with human perception and cognition opens up new avenues for research and exploration in several domains.

Practical Implications

An influential practical implication of utilizing AVP is its potential to significantly transform educational environments significantly through immersive and interactive learning experiences. AVP enhances visual learning by enabling students to explore diverse educational topics using its advanced features. Its high-resolution displays and accessibility features cater to various learning needs, offering real-time visual aids for students with visual impairments, personalized learning experiences, and opportunities for remote learning.

Moreover, AVP fosters inclusivity by providing equal access to educational resources and enhancing student engagement. Its interactive capabilities allow for gamified learning experiences, virtual field trips, and simulations that bring abstract concepts to life. Educators can leverage these tools to create dynamic teaching environments that cater to different learning styles and foster creativity and critical thinking.

This study proves from its findings that the practice of this AVP model and the validated PLS have resulted in the capability of this model to find the contributing factors for predicting the AU of AI features with the deployment of WI, IG, student SAT, and PH factors. Also, this study explains the implementation of AVP model and uses PLS to validate its results effectively. Furthermore, it deploys student SAT and PH, WI, and IG factors in a reasonable capability. The practical part used the standard features applied in BUC MOODLE platform. Then, the theoretical model parts rely on the features available in this application to test and validate all the hypotheses and reveal the significant impact on relationships between the identified factors.

Limitations and Future Studies

The study conceptual model is constrained to two prominent adoption theories, limiting its scope. Hence, forthcoming research could integrate additional theories such as TAM and UTAUAT. Moreover, this study is confined to the educational domain, specifically gathering students' perspectives. Future investigations could explore how AVP enhances immersive experiences across augmented and virtual environments, paving the way for innovative applications in diverse sectors like entertainment and education. Additionally, the study predominantly examines features that enhance educational settings, particularly benefiting users with visual impairments. Leveraging these features effectively could significantly impact the evolution of teaching strategies embraced by stakeholders. Consequently, future studies might underscore the significance of these features for handicapped students or those with special needs.

In terms of context, this model was only tested in the context of one Omani HEI. Before the other two failed hypotheses can be disregarded entirely, this model can be tested and extended in other contexts, whether in other Omani HEIs or outside Oman. This will give better insights as to whether the selected constructs for the model are genuinely relevant and applicable to assess AVP's AI features using e-learning systems.

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Data availability: Data generated or analyzed during this study are available from the authors on request.

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