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Digital Experience and Purchase Intention in Online Courses: The Moderating Role of Emotional States

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Abstract
This study examines the attributes of virtual reality (VR) technology to delineate three fundamental dimensions of digital experience in online education: virtual reality scenes, virtual character-led teaching, and virtual reality games. Data were collected through a questionnaire administered to 405 individuals with prior VR experience, and structural equation modelling (SEM) was utilised to analyse the relationship between digital experience and purchasing behaviour. The findings indicate that each of the three dimensions of digital experience exhibits a significant and positive correlation with purchase intention, with instruction led by virtual characters exerting the greatest influence. Furthermore, the moderating variable—emotional state—demonstrates that positive emotions amplify the impact of digital experience on purchase intention. These results contribute valuable theoretical insights for users, expand the understanding of digital experiences in online education, and offer practical recommendations for the design of VR-enhanced courses and VR-driven marketing strategies.

Keywords: Virtual Reality, Digital Experience; Online Courses; Emotional States; Purchase Intention; Positive Emotion.

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Introduction

Digital technology is now widely integrated across multiple sectors, including education, business, and healthcare (Gao, 2016; Kaur et al., 2022; Mallam et al., 2019). Its influence is particularly evident in advancements such as the Internet, mobile communication, and virtual reality. The Internet has evolved through three major stages—Web 3.0, Web 2.0, and Web 1.0—each representing a significant milestone (Barassi & Treré, 2012; Fuchs et al., 2010). The emergence of Web 2.0 transformed the Internet from a mere conduit for information dissemination into an interactive virtual network facilitating human connectivity. Both academic and industry discourse have examined the future trajectory of Internet development, identifying Web 3.0 as a natural progression of Web 2.0. Distinguished by greater intelligence and immersive capabilities, Web 3.0 is regarded as a foundational stage leading to the Metaverse, which represents the ultimate phase of Internet evolution and an inevitable shift towards societal digitalisation and virtualisation (Song et al., 2023).

The Edu-Metaverse refers to the integration of metaverse technologies within the educational domain, demonstrating a positive influence on users' digital identities. By creating interconnected offline and online learning environments within a virtual space, it offers a flexible setting for both educators and students while facilitating interactive teaching and learning experiences. Its primary advantage lies in its capacity to deliver an immersive educational experience, simultaneously addressing the pedagogical needs of both teachers and learners across physical and virtual contexts (Hua & Huang, 2021). Although the complete realisation of the educational metaverse remains a long-term endeavour, continuous technological advancements have driven efforts to enhance online learning (Nesenbergs et al., 2020; Tan et al., 2022).

Augmented Reality (AR) and VR provide an innovative approach to traditional classroom instruction by enriching real-world experiences through a learner-centred methodology (Mallam et al., 2019). These technologies enable the incorporation of digital experiences, interactive environments, and simulations into the educational process (Al-Ansi et al., 2023). Numerous advantages of AR and VR have been documented, and they are widely utilised across various sectors, including navigation, medicine, and higher education (Mallam et al., 2019; Pregowska et al., 2021). However, their specific role and impact within the domain of paid online education remain insufficiently explored. This gap may be attributed to variations in wearable tracking devices or the difficulties educational institutions encounter in rapidly adopting and developing these technologies (Al-Ansi et al., 2023). As the AR and VR markets within education continue to expand (Maunder, 2018), it is essential to examine the influence of digital experiences in online education on consumer purchasing decisions, thereby assisting management in formulating effective business strategies (Radianti et al., 2020).

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Existing research on the determinants of online purchase intention has predominantly centred on conventional online retail, investigating factors such as website quality, interactivity, trust, and electronic word-of-mouth (eWOM) as primary influences on consumer decision-making (Harrigan et al., 2021; Saleem et al., 2022; Sardar et al., 2021; Summerlin & Powell, 2022). As online consumption continues to expand, consumers are increasingly purchasing not only physical products but also digital services. Online courses, as a service-based offering, prioritise the overall consumption experience rather than the acquisition of tangible goods, as seen in retail transactions (Taylor Jr et al., 2018). Given the rapid growth of the paid education market and the service-oriented nature of online learning, a deeper exploration of consumer purchase intentions in this context is essential (Zhang et al., 2023). To bridge this research gap, the present study introduces a novel conceptual framework that examines the role of digital experiences in online education, specifically analysing how these experiences—facilitated by AR and VR technologies—influence consumer purchase behaviour and decision-making (Satu & Islam, 2023).

Perceived affectivity encompasses consumers' emotional responses towards a specific product or service delivery (Yimer et al., 2023), encompassing a range of emotions such as love, hate, happiness, sadness, and anger (Kim et al., 2020). A widely recognised framework for defining human emotions is the PAD model, which categorises affective states based on pleasure, arousal, and dominance. Research on consumer purchase intention has frequently incorporated the PAD model within the framework of the Stimulus-Organism-Response (SOR) model, considering emotional perception as an organismic factor to examine its moderating effects (Tilahun et al., 2023). However, the role of positive and negative affective states has not been extensively explored in such studies, particularly in relation to their moderating influence on the relationship between consumption contexts and purchase intentions.

The findings indicate that digital experiences in online courses—namely, virtual reality environments, instruction led by virtual characters, and VR-based gaming—have a positive influence on purchase intentions. Among these factors, virtual character-led teaching exerts the strongest impact on consumers' purchasing decisions. Furthermore, the study highlights emotional states as a key moderating factor, enhancing the relationship between digital experiences and purchase intentions.

Conceptual Framework and the Development of Hypotheses

Online Courses and Digital Experience

Since 2020, the COVID-19 pandemic has significantly influenced educational reform. However, scholars continue to express concerns regarding the effectiveness of online education, highlighting several limitations. For instance, traditional web-based platforms are often regarded as static and unengaging, failing to sustain students'

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enthusiasm for learning. Additionally, existing online learning environments frequently lack provisions for skills training and practical application (Carrillo & Flores, 2020). Students have consistently demonstrated a preference for in-person instruction over remote learning, favouring synchronous online formats with live streaming and interactive chat over asynchronous methods (Ives, 2021). These findings underscore the necessity of incorporating active learning strategies and fostering a sense of community within online courses.

At present, two-dimensional network technologies are inadequate in meeting students' expectations for immersive learning, seamless human-computer interaction, and realistic social engagement akin to face-to-face communication. To advance online education and position it as a leader in the future of learning, it is crucial to identify innovative solutions and transformative approaches. Recent developments in VR, AR, and mixed reality (MR) offer substantial potential to revolutionise the education system (Grainger et al., 2021).

AR and VR have introduced a transformative shift in education by advancing technology-enhanced learning within educational systems. These technologies facilitate the development of immersive learning experiences, fostering deeper comprehension and greater engagement among students. Additionally, they enable educators to organise virtual field trips, an opportunity that traditional teaching methods cannot provide (Phakamach et al., 2022; Vretos et al., 2019). VR operates by integrating computer-generated simulations with specialised equipment to produce realistic sensory stimuli—including vision, touch, and, in some cases, smell—thereby creating a highly immersive environment. Within these virtual spaces, users interact with digitally constructed objects, locations, and events (Jahan & Sanam, 2024). Drawing upon the key components of virtual reality, this study categorises digital experiences in online courses into three primary dimensions: virtual reality scenes, virtual character-led teaching, and virtual reality games.

Digital Experience and Purchase Intention

As a real-time, continuous, and interactive multi-sensory experience within a responsive, computer-generated three-dimensional virtual environment, artificially simulated VR is regarded as a user-centred and enhanced experience design. According to Parekh et al. (2020), the integration of AR and VR is accelerating advancements across various industries, including retail, gaming, and healthcare. The adoption of emerging technologies such as AR enables organisations to drive sales growth, increase revenue, and foster brand loyalty (Kvíčala et al., 2024). AR technology enhances the consumer shopping experience due to its diverse applications and user-friendly nature (Manis & Choi, 2019).

In the context of AR- and VR-enabled online shopping, these technologies provide immersive experiences and interactive elements that influence consumer attitudes and

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facilitate purchase decisions (Kang et al., 2020; Wedel et al., 2020). Within distance education, VR enhances learning engagement by simulating real-world scenarios, allowing students to acquire practical knowledge without physically leaving the classroom (Hamilton et al., 2021). This approach enables learners to focus on specific fields such as business and professional development (Liu et al., 2020) while strengthening relationships between instructors and students. In virtual learning environments, students engage in collaborative activities that promote collective knowledge construction (Young et al., 2020). Furthermore, educators can integrate gamification into lessons through AR and VR applications, thereby increasing engagement and making the learning process more interactive and enjoyable (Mystakidis et al., 2021). A comparative study has demonstrated that gamified VR educational tools enhance student performance, with 2D, 3D, and VR-based tools exhibiting similar levels of perceived usefulness and usability (Chávez et al., 2020). Therefore, this study proposes that enhancing perceptions of digital experiences will positively influence consumers' purchasing decisions regarding online courses.

H1: Virtual reality scenes have a positive impact on purchase Intention.
H2: Virtual character-led teaching has a positive impact on purchase Intention.
H3: Virtual reality games have a positive impact on purchase Intention.

The Moderating Role of Emotional States

Previous research supports the notion that consumers' emotions significantly influence their purchasing decisions. Given the complexity of emotional responses, scholars have frequently utilised the PAD model to evaluate consumer emotional experiences (Satu & Islam, 2023; Tilahun et al., 2023). Empirical findings suggest that among the three dimensions of the PAD model—Pleasure, Arousal, and Dominance—pleasure exerts the most substantial influence compared to arousal and dominance. Pleasure is a critical component of emotionally driven experiences (Zhang et al., 2023). When consumers experience happiness, they are more likely to feel pleasure and excitement, leading to prolonged interaction with the retail environment and, consequently, an increase in purchase intentions. Additionally, positive emotional states enhance consumer enjoyment and satisfaction with a product, thereby strengthening their intention to make a purchase (Satu & Islam, 2023).

However, much of this research is grounded in the SOR model, where emotional states are primarily considered facilitative variables linking product experience to purchase intention. For instance, in online shopping contexts, a brand's digital interface can generate feelings of pleasure and excitement, positively influencing consumers' continued use of the application (Hsieh et al., 2021). While existing studies acknowledge that product experiences shape consumers' emotional states, limited research has explored the variations or intensity of these emotional states as moderating factors in the relationship between product experience and purchase intention. To fill this gap, this study analyses how emotional states moderate the

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relationship between digital experiences and purchase intention in online courses, forming the following hypotheses (Figure 1).

H4a: The effect of virtual reality scenes on purchase intention is positively moderated by emotional states.
H4b: Emotional states positively moderate the relationship between virtual character-led teaching and purchase intention.
H4c: The relationship between virtual reality games and purchase intention is positively moderated by emotional states.

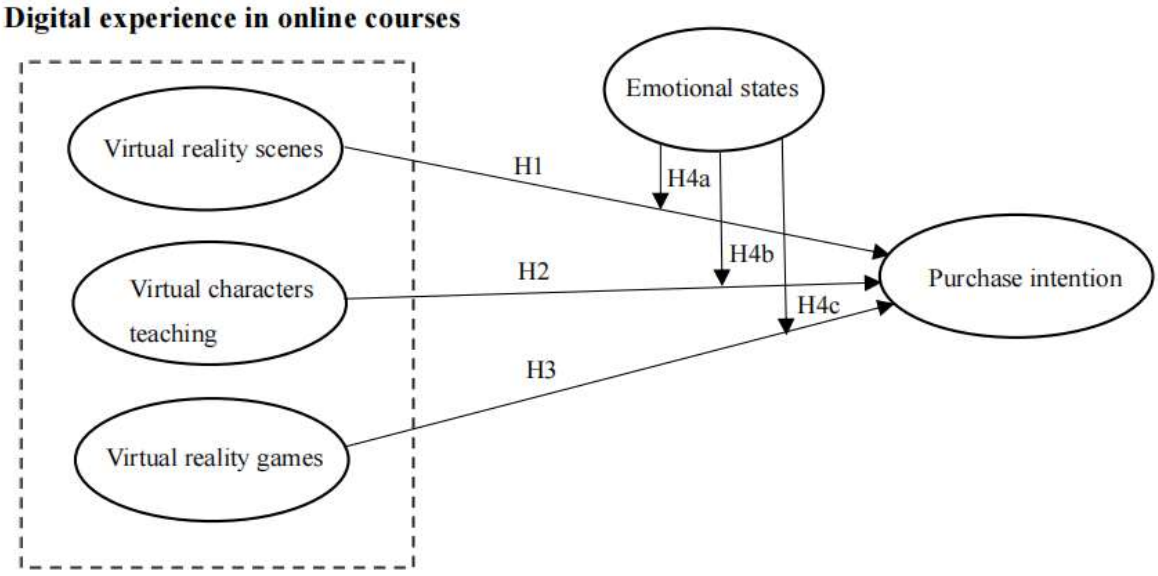

Figure 1: Research Model Illustrating Digital Experience in Online Courses

Methodology

Data Collection and Sample Demonstration

This study utilised an online survey as the primary data collection method. The survey was conducted via the platform 'Wenjuanxing,' which has a user base exceeding 6.2 million and is widely distributed across various regions of China. In recent years, this platform has gained prominence among researchers, particularly in studies related to consumer behaviour (Li et al., 2024; Xue et al., 2023). To mitigate potential measurement errors, the survey questionnaire underwent a pilot test involving three experts, followed by a preliminary survey before full-scale distribution.

The study targeted respondents who had prior experience with Virtual Reality (VR) technology and its digital applications. Since the ability to pay for knowledge-based services was a prerequisite, only individuals aged 18 years and above were included. Participants accessed the survey via a web link, and their voluntary participation was incentivised with a reward of 10 RMB upon completion. To ensure sample validity, the initial section of the questionnaire contained two screening questions: one

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assessing prior experience with VR-based digital applications and another evaluating interest in integrating VR technology into online courses.

Cochran's formula estimated a required sample size of 384 for an infinite population. Of 454 collected questionnaires, 405 were validated after excluding unsuitable responses. The final sample was 53.6% male and 46.4% female, with most participants aged 25–34 (44.0%) or 18–24 (26.7%). Educationally, 48.1% held a bachelor's degree and 41.0% a junior college qualification. Government employees comprised the largest occupational group (25.9%). Monthly income distribution showed 35.1% earning below 5,000 RMB and 22.2% between 5,000–9,999 RMB. Table 1 summarises the demographic details.

Table 1: Construct Reliability and Validity.

Measure	Items	Frequency	Percentage (%)
Gender	Male	217	53.6
	Male	188	46.4
Age in Years	18–24	108	26.7
	25–34	178	44.0
	35–44	77	19.0
	45 and Above	42	10.4
Education Status	Junior College	166	41.0
	Bachelor's Degree	195	48.1
	Master's Degree or Above	44	10.9
Occupation	Student	42	10.4
	Company Employee	81	20.0
	Educator	85	21.0
	Government Employee	105	25.9
	Self-Employed	92	22.7
Monthly Income	Below RMB 5,000	142	35.1
	RMB 5,000-9,999	90	22.2
	RMB 10,000-14,999	89	22.0
	Above RMB 15,000	84	20.7

Structure of Questionnaire

The questionnaire comprised two sections: the first collected demographic data (Table 1), while the second included measurement scales for study variables. Digital experiences in online courses, the independent variable, had three dimensions—virtual reality scenes, virtual character-led teaching, and virtual reality games—each measured with five items. Purchase intention (dependent variable) was assessed with three items, and emotional states (moderating variable) with four items, totalling 22 items across five variables. All items were adapted from established studies to suit VR

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and online courses. A 7-point Likert scale (1 = strongly disagree, 7 = strongly agree) was used. Table 2 details the measurement items.

Table 2: Demonstrates the Variable Questionnaire

Variables	Dimensions	Number of Items	Source
Digital Experience in Online Courses	Virtual reality scenes	5	(Al-Ansi et al., 2023; Gao et al., 2023; Petersen et al., 2022; Taufiq et al., 2021)
	Virtual character-led teaching	5	
	Virtual reality games	5	
Emotional States		4	(Satu & Islam, 2023; Zhang et al., 2023)
Purchase Intention		3	(Zhou et al., 2022)

Data Analysis Method

The analysis followed a systematic approach comprising multiple stages. Initially, descriptive statistics were applied to the demographic data using freely available statistical software to gain insights into participant characteristics. Subsequently, reliability and validity tests were conducted to ensure the accuracy and consistency of the measurement instruments. Structural equation modelling (SEM) was then employed using AMOS to evaluate the hypothesised relationships and the moderating effects. Finally, both overall and multi-group path coefficient analyses were performed on the theoretical model to validate the hypothesis results and assess the robustness of the findings.

Results

Reliability and Validity

All item factor loadings exceeded 0.5, demonstrating strong associations between constructs and their corresponding measurement items. CR for each construct was above 0.7, indicating a high level of internal consistency. Convergent validity was confirmed, as the AVE values for all constructs surpassed 0.5, with the exception of emotional states. The AVE value for emotional states was 0.473, which, although slightly below the recommended threshold of 0.5, remains acceptable as it exceeds 0.4 and is supported by a CR value above 0.6. This suggests an adequate level of reliability (Table 3). These results align with established validation guidelines (Lam, 2012; Leong et al., 2022), confirming the scale's overall convergent validity.

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Table 3: Demonstration of Measurement Model

Construct	Item	Factor Loading	CR	AVE
Virtual Reality Scenes			0.855	0.542
VRS1	The virtual reality scenes in online courses allow me to learn in various environments.	0.738		
VRS2	The virtual reality scenes in online courses give me an immersive experience.	0.737		
VRS3	The virtual reality scenes in online courses make me feel fully engaged.	0.727		
VRS4	The virtual reality scenes in online courses make the course content richer and more vivid.	0.739		
VRS5	The virtual reality scenes in online courses help me better understand the learning content.	0.739		
Virtual Character-Led Teaching			0.862	0.555
VCT1	Virtual characters in teaching provide a personalized learning experience.	0.729		
VCT2	Virtual characters in teaching create a sense of human interaction.	0.752		
VCT3	Virtual characters in teaching respond to my needs in a timely manner.	0.768		
VCT4	Virtual characters in teaching make learning feel warmer and more human.	0.718		
VCT5	Virtual characters in teaching enhance my interaction with the instructor.	0.758		
Virtual Reality Games			0.861	0.554
VRG1	Courses with virtual reality games are more engaging.	0.742		
VRG2	Courses with virtual reality games increase my interest in learning.	0.773		
VRG3	Courses with virtual reality games make my learning experience more rewarding.	0.750		
VRG4	Courses with virtual reality games help me grasp key points more effectively.	0.722		
VRG5	Courses with virtual reality games improve my learning efficiency.	0.732		

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Table 3: Demonstration of Measurement Model(cont…)

Construct	Item	Factor Loading	CR	AVE
Emotional States	When learning through online courses with virtual reality(VR) experiences, I feel:		0.781	0.473
ES1	Very unhappy — Very happy	0.712		
ES2	Very dissatisfied — Very satisfied	0.677		
ES3	Very calm — Very excited	0.690		
ES4	Very bored — Very interested	0.671		
Purchase Intention			0.815	0.595
PI1	VR-enhanced online courses increase my willingness to purchase.	0.780		
PI2	I am considering purchasing online courses with VR experiences.	0.757		
PI3	I am willing to pay for online courses that use VR technology.	0.776		

As shown in Table 4, the square root of each AVE exceeded the corresponding correlations, confirming stronger associations within constructs than between them. These results validate the distinctiveness of all constructs, ensuring they measure unique aspects of the theoretical model. To reduce social desirability bias, variable names were modified in the questionnaire. Harman's single-factor test assessed common method bias, revealing a highest variance of 36.87%, below the 50% threshold. This confirms that common method bias is not a major concern, ensuring the reliability and validity of the measurement model.

Table 4: Discriminant Validity

	VRS	VCT	VRG	ES	PI
VRS	**0.736**				
VCT	0.570	**0.745**			
VRG	0.631	0.605	**0.744**		
ES	0.499	0.456	0.460	**0.688**	
PI	0.524	0.524	0.526	0.591	**0.771**

Note: Values highlighted in bold indicates the square root of the AVE values.

Structural Model Analysis

This study used AMOS structural equation modelling (SEM) to evaluate the associations between VRS, VCT, and VRG and purchase intention (PI). The model was evaluated using CMIN/DF, CFI, TLI, and RMSEA fit indices. The outcomes were: CMIN/DF = 1.385, CFI = 0.985, TLI = 0.980, RMSEA = 0.030. The model fits well because CMIN/DF is below 3, CFI and TLI surpass 0.9, and RMSEA is under

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0.05. Further structural analysis was conducted using standardised path coefficients and significance values (p-values) (Figure 2). The findings indicated that all paths yielded p-values below 0.01, confirming statistical significance. Moreover, the three latent variables representing digital experiences in online courses—VRS, VCT, and VRG—exhibited significant positive effects on purchase intention (PI), thereby providing empirical support for hypotheses H1, H2, and H3 (Table 5).

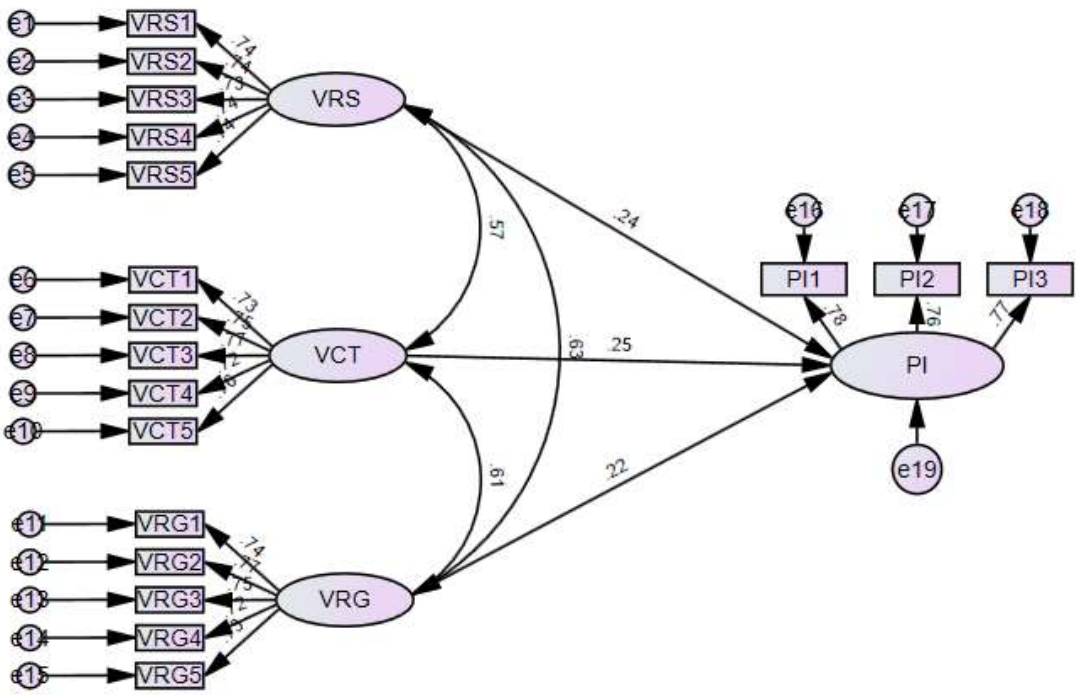

Figure 2: Demonstrates the Structural Results

Table 5: Hypothesis Results

Hypothesis	Path	Standardized Path Coefficients	P-Value	Result
H1	VRS → PI	0.239	0.002	Supported
H2	VCT → PI	0.253	<0.001	Supported
H3	VRG → PI	0.222	0.005	Supported

Test of Moderating Effects

This study used free statistical tools and AMOS to evaluate how ES moderates the link between digital experiences and purchase intention (PI). In AMOS, independent variables were centred, interaction terms formed, and a SEM constructed. The impact of interaction terms on PI was examined. Table 6 reveals that ES significantly moderates the impact of VRS, VCT, and VRG on PI ($\beta = 0.165$, $P = 0.005$, $\beta = 0.196$, $P = 0.003$, and $\beta = 0.192$, $P = 0.008$), supporting hypotheses H4a, H4b, and H4c.

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Table 6: Results of Moderation Analysis

Hypothesis	Interactions	Dependent Variable	β	P-Value	Result
H4a	VRS * ES →	PI	0.165	0.005	Validated
H4b	VCT * ES →	PI	0.196	0.003	Validated
H4c	VRG* ES →	PI	0.192	0.008	Validated

Discussion

Theoretical Implications

The proposed study on VR and its application in online courses introduced three dimensions of digital experience and examined their influence on consumers' purchase intentions. Additionally, it uniquely incorporated emotional states—an often-overlooked factor in digital consumer behaviour research—to explore their moderating role between digital experience and purchase intention. This approach offers a novel perspective and valuable insights for related studies. The findings indicate that, within the context of online courses, constructing virtual reality scenes, integrating virtual characters in teaching, and incorporating virtual games significantly enhance consumers' digital experiences, thereby increasing their intention to purchase online courses. By situating digital experiences within online education, this study provides a more concrete representation of these experiences and offers theoretical references for future research on digital experience and purchase intention.

Notably, as shown Table 5, the study observed that the p-value for virtual character-led teaching was less than 0.001, indicating the most significant positive effect on consumers' purchase intentions. This suggests that, among various applications of real and virtual technologies in teaching interactions, consumers exhibit a stronger preference for learning and interacting with virtual characters rather than real teachers. The finding aligns with prior research demonstrating that virtual assistants or chatbots can enhance purchase intentions (Ischen et al., 2022; Song et al., 2024). The p-values for virtual reality scenes (0.002) and virtual reality games (0.005) further confirm their significant positive effects on purchase intention. This suggests that replacing traditional two-dimensional interfaces with VR-based course content enhances learners' engagement, making the learning process more immersive and interactive. The construction of VR scenes enhances the learning context, leading to improved learner performance (Liu et al., 2020). Similarly, integrating virtual reality games increases the appeal of learning content, making the learning experience more enjoyable and reducing boredom, thereby enhancing purchase intentions (Makransky et al., 2021).

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Suggestions

The study outcomes offer significant implications for the development of course content on online education platforms and the e-advertisement of online service products. Firstly, when designing new online courses, integrating VR more actively and aligning content with immersive scenes and virtual characters, rather than relying on traditional instructional methods, is essential. A stronger emphasis should be placed on designing and developing virtual characters, as they have demonstrated a greater impact on purchase intentions and teaching effectiveness. Enhancing learner engagement through virtual instructors or fully replacing human teachers with virtual characters could further improve educational outcomes.

Consequently, the advancement of micro-technologies that enable the presentation of course materials as VR scenes is necessary to enrich learning immersion. Additionally, incorporating virtual reality games into academic settings can capture learners' attention and foster increased course enrolment by making the learning experience more engaging. Moreover, the findings highlight that digital experience and purchase intention are mediated by strong and positive emotions. Therefore, in marketing online service products, businesses should not only prioritise the use of advanced technology to enhance digital experiences but also ensure that these experiences evoke positive emotional states. Only when consumers derive positive emotions from digital interactions can their purchase decisions be effectively influenced.

Limitations and Future Direction

This study sheds light on how VR-enabled digital experiences affect online education buying intentions. There are limitations, though. The data was limited to China, which may limit its generalisability. To confirm the association between digital experience and purchase intention, future studies could track online course purchases or scrape data. Finally, while this study focused on online education, digital experiences may affect purchasing intentions in travel, retail, and healthcare. Further research should examine these industries to better understand customer behaviour in VR-enabled digital worlds.

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