Shahid Bahonar University of Kerman

Journal of New Studies in Sport Management

Online ISSN: 2717 - 4069

Homepage: https://jnssm.uk.ac.ir

Iranian Scientific Association of Sport Management

The Behavioral Intention of Coaches in Virtual Reality: The Roles of Perceived Usefulness, Enjoyment, Performance Expectancy, Self-Efficacy, and Ease of Use

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ARTICLE INFO

Article type:
Original article

Article history:
Received: 19 October, 2023
Received in revised form: 15 December, 2023
Accepted: 18 April, 2024
Published online: 11 August, 2024

Keywords:
Sports Coaching
Simulation
Technology Acceptance Model
Virtual Environment
Virtual Reality

ABSTRACT

The aim of the current research was to investigate the behavioral intention of coaches in virtual reality with considering the roles of Perceived Usefulness, Enjoyment, Performance Expectancy, Self-Efficacy, and Ease of Use. To collect the research data, a researcher-developed questionnaire with two sections was used. The first section included participants' demographic information, and the second section was used to collect data on research dimensions and variables. All questionnaires in this study utilized a 5-point Likert scale. The statistical population of this research included all sports coaches in Guilan province, Iran, both in individual and team disciplines, with a sample size of 350 individuals. SPSS software was employed for descriptive statistics, and Smart PLS was used for structural equation modeling. The results indicated that perceived usefulness, self-efficacy, enjoyment, ease of use, and performance expectancy have a positive and significant impact on the intention towards virtual reality behavior. Considering the current findings, the use of virtual reality in sports coaching can be recognized as a powerful tool for enhancing athletes' learning experiences, increasing enjoyment, and fostering a stronger and better inclination for active participation in sports activities.

Introduction

In the late twentieth century, technology gained popularity in the field of education, and its evolution continued into the twenty-first century. Notably, technologies such as augmented reality and immersive experiences in simulated environments, such as virtual reality (Sala, 2021), have seen significant advancements over the past decade, particularly in the development of virtual environments (Ruffaldi & Filippeschi, 2013). These advancements have facilitated the integration of virtual environments that were previously constrained by expensive systems and limited safety

How to Cite: Benar, N., Fatahi Milasi, S., & Nazarian, A. (2024). The Behavioral Intention of Coaches in Virtual Reality: The Roles of Perceived Usefulness, Enjoyment, Performance Expectancy, Self-Efficacy, and Ease of Use. Journal of New Studies in Sport Management, 5(3), 1187-1198. doi: 10.22103/jnssm.2024.22372.1229

 Publisher: Shahid Bahonar University of Kerman
DOI: 10.22103/jnssm.2024.22372.1229

concerns. Historically, the analysis of athletes' performance and the understanding of information in various sports disciplines were conducted using video footage (Fu & Liu, 2021). However, this method had limitations, such as the fixed camera position during recording, determining the perspective obtained. This type of performance analysis hinders interaction and observation of the environment, essential for athletes' learning. When an athlete trains in a virtual environment, their movements provide visual feedback captured by cameras during recording. If the camera records from a fixed perspective, it may fail to extract visual information that typically occurs in real sports situations (Mazyn, Lenoir, Montagne, & Savelsbergh, 2004). Consequently, this research aims to investigate virtual reality in sports coaching.

Virtual reality in sports coaching involves the use of three-dimensional digital environments to create fully immersive and realistic learning experiences (Thatcher, Ivanov, Szerovay, & Mills, 2020). This technology is increasingly utilized in education as an instructional tool due to its capability to provide active learning, intuitive decision-making, and engagement in activities (Jerald, 2016). Previous studies have demonstrated the benefits of using virtual reality in dynamic learning environments (Lin & Yeh, 2019; Lindgren, Tscholl, Wang, & Johnson, 2016). Furthermore, computer simulations and virtual reality have recently emerged as alternative tools for simulating sports environments (Jackson II, 2021). This area of technological advancement has been recently explored and has the potential to offer a more comprehensive and interactive learning experience for athletes. The emergence of three-dimensional virtual reality technology has transformed the virtual reality domain, providing individuals with an immersive experience in an environment that would otherwise be impossible to obtain (Li, 2021). In comparison to traditional videos with a fixed perspective, virtual reality can offer visual simulations and interactive environments that provide a more engaging and realistic experience for athletes and coaches (Fortes et al., 2021). Given the aforementioned considerations, the importance of conducting research on the behavioral intentions of coaches towards virtual reality becomes prominent.

The use of virtual reality in sports offers numerous advantages, including accessibility, cost reduction, realism, and safety (Ahir, Govani, Gajera, & Shah, 2020). Furthermore, the utilization of virtual reality for exercise purposes can reduce errors, enhance the learning experience, increase time efficiency, and lower costs (Nor, Sunar, & Kapi, 2019). Virtual reality simulation can also improve knowledge, psychomotor skills, and motivation (Abich IV, Parker, Murphy, & Eudy, 2021). Virtual reality can enhance interaction, provide new ways to explore content, and facilitate interactive learning (Makransky, Terkildsen, & Mayer, 2019). It provides coaches and athletes with a powerful method to diversify training, transitioning from physical simulations to entirely virtual environments. Additionally, it allows for remote learning with a smaller physical footprint and maintenance considerations. Virtual reality empowers coaches and athletes to practice skills at their own pace and time (McCosker, Otte, Rothwell, & Davids, 2022). Given the raised topics, this research can highlight the expectations coaches have regarding athletes' performance and, based on athletes' performance in virtual space, inform sports coaches' behavior towards competition planning.

Facilitating the acceptance and use of virtual reality in sports education and coaching is only comprehensible when coaches and athletes actively engage with this technology and choose it over other educational tools or simulators. However, specific factors driving the use of virtual reality in a dynamic learning environment have not been extensively studied (Sagnier, Loup-Escande, Lourdeaux, Thouvenin, & Valléry, 2020). Additionally, its acceptance in sports coaching has been relatively slow (Farley, Spencer, & Baudinet, 2019), partly due to various factors influencing the adoption and utilization of the technology. Understanding these factors and developing a comprehensive model that addresses the unique features and challenges associated with implementing virtual reality in sports coaching is crucial. The proposed model for coaches' behavioral intentions towards virtual reality considers various influential factors, including perceived usefulness, ease of use, enjoyment, self-efficacy, and expectation-performance. By examining these factors, coaches can better comprehend the determinants of virtual reality acceptance and design effective strategies to overcome potential barriers. The significance of this study lies in guiding not only researchers but also coaches and athletes in maximizing the benefits of virtual reality technology in sports coaching. By presenting a model, this research contributes to

the literature on virtual reality and its use in sports coaching, providing practical concepts for coaches, sports organizations, and virtual reality developers.

Virtual reality has become increasingly popular in sports coaching due to its ability to simulate real-life events and provide an objective perspective on a player's suitability for a specific situation (Bideau et al., 2009). Active learning using virtual reality for complex and dynamic concepts can have a positive impact on learning and understanding (Lindgren et al., 2016). Additionally, virtual reality technology allows training to extend beyond the sports field, enabling users to repeat tasks in a safe and cost-effective environment. This can enhance cognition, memory, visuospatial skills, psychomotor skills, and emotional responses (Jensen & Konradsen, 2018).

A review and summary of theoretical and empirical studies indicate that researchers have focused on several axes of virtual environments in sports, including interaction with a humanoid (Michalski et al., 2019), the impact of adding ball rotation during a free kick on professional football players' perception of ball arrival position (Zhao & Guo, 2022), using virtual reality to enhance decision-making skills of drivers in reducing the risk of accidents and associated costs of track, vehicle maintenance, and crew (Yeung & Chan, 2017), the effectiveness of virtual reality for acquiring, maintaining, and transferring equestrian skills leading to improved horseback riding performance (Farley et al., 2019), development of free-throw skills in basketball (Covaci, Postelnicu, Panfir, & Talaba, 2012), cricket batting (Kelly, Stafford, Craig, Herring, & Campbell, 2022), training in martial arts (Mohd Jelani, Zulkifli, Ismail, & Yusoff, 2019), and fundamental movements of muay thai (Wongso & Istiono, 2023). Additionally, virtual reality and students' self-efficacy (Mousavi, Shahbazi, Arabameri, & Shirzad, 2019), virtual reality and perceptual-motor performance of taekwondo athletes (Torabi & Delkash, 2022), virtual reality in learning table tennis forehand (Lotfi, Mohamad Zadeh, & Sohrabi, 2017), improvement of coaching and performance analysis (Le Noury, Buszard, Reid, & Farrow, 2021), sports mental readiness (Frank, 2020), skill analysis and feedback (Oagaz, Schoun, & Choi, 2021), and facilitating remote coaching (Georgiadis et al., 2021). Considering the review of previous studies, the research gap and existing knowledge vacuum can be analyzed from several perspectives. Firstly, the field of virtual reality studies in sports is still in its infancy, and many dimensions of knowledge and virtual reality have not yet been thoroughly examined and adapted to the field of sports. Secondly, the majority of scientific findings are related to the examination of developed and leading sports countries (such as England, the United States, and others), and significant experiences from developing countries (such as Iran) have not been documented by researchers. Additionally, from a methodological standpoint, it can be stated that the nature of components and analytical frameworks in previous studies has mainly focused on studying the development of sports skills in athlete-oriented research. Given the high and necessary functionality of quantitative studies to enhance knowledge in emerging fields and developing regions, and the existing vacuum in this regard, the present research has been focused on addressing a part of this knowledge gap. It aims to provide a conceptual model for applied researchers and scientific findings for industry managers and decision-makers in the sports sector in developing countries.

Considering the topics discussed, it can be said that individuals' understanding of virtual reality technology may influence their usage and attitudes towards it (Davis, Bagozzi, & Warshaw, 1989). The existing literature suggests an appropriate approach for investigating coaches' acceptance of virtual reality technology in coaching and its expansion to include factors related to virtual reality and learning (Shen, Ho, Ly, & Kuo, 2019). The dimensions utilized in this study form a behavioral intention model of coaches towards virtual reality, encompassing dimensions that have previously been confirmed in their relationships. The structures directly relate to training, learning, and the use of virtual reality technology for sports exercises. The five dimensions defined in this research include perceived usefulness, enjoyment, performance expectancy, self-efficacy, and ease of use. Perceived usefulness is the degree to which an individual believes that using a specific system enhances their job performance (Davis et al., 1989). Ease of use is the degree to which a person believes that using a particular system is effortless (Davis et al., 1989). Enjoyment is an intrinsic motivator, describing the user's appreciation of the technology experience regardless of expectations or outcomes (Abdullah & Ward, 2016). Performance expectancy is related to the belief that virtual reality technology enhances performance compared to other instructional tools (Shen et

al., 2019). Self-efficacy is a judgment about an individual's ability to use technology to perform a specific task or duty (Venkatesh, Morris, Davis, & Davis, 2003). All the proposed hypotheses are derived from previously confirmed relationships using models employed in the virtual reality field. These dimensions have been integrated into a new approach for the educational and learning environment in sports and virtual reality technology. The research's conceptual model in Figure 1 illustrates the relationships between variables. Ultimately, this framework can contribute to understanding the factors influencing coaches' behavioral intentions towards the use of virtual reality technology in sports coaching and can enhance the design and implementation of virtual reality technology for sports training objectives. In conclusion, this study examines the question: What factors influence coaches' behavioral intentions to use virtual reality technology in sports coaching?

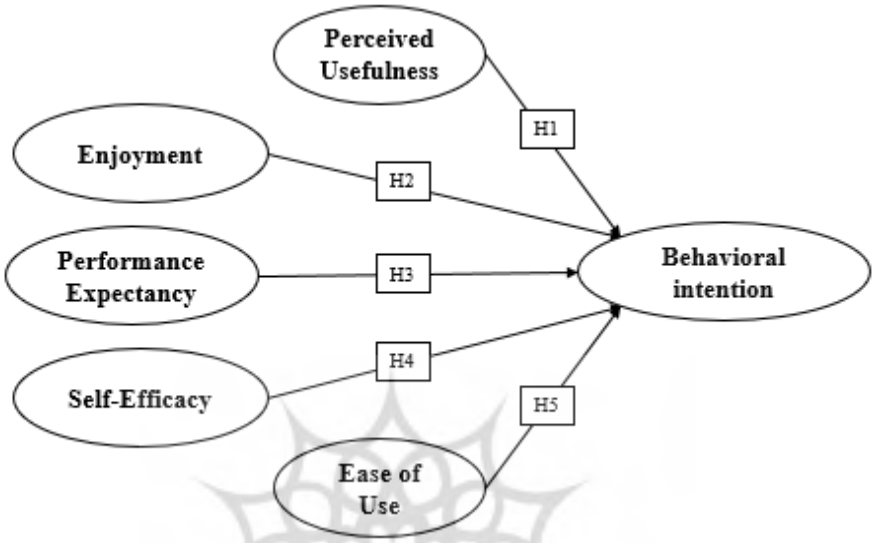

Figure 1. Conceptual model of research

Methodology

This research is quantitative, and in terms of purpose, it is applied, utilizing a descriptive-survey strategy. The population of this study consisted of all sports coaches (both team and individual sports). To determine the minimum sample size in PLS-SEM, the 10 times rule for latent variables was employed (Hair Jr, Sarstedt, Hopkins, & Kuppelwieser, 2014). Following this rule (the sample size should be 10 times the number of latent variables), a sample size of 350 was considered to increase the reliability of the research results. The participants were recruited through convenience sampling and were sent an online questionnaire to virtual pages of active sports associations in the Guilan province. Given the distribution of the questionnaire online, researchers continued the distribution of the questionnaire until reaching the expected sample size. Ultimately, with 350 questionnaires collected over a period of 45 days, the data became the basis for analysis. Data were collected using a questionnaire adopted from the research literature. The first section included participants' demographic information. The second section measured perceived usefulness with questions 1 to 3, ease of use with questions 13 to 15 (Davis et al., 1989), enjoyment with questions 4 to 6 (Abdullah & Ward, 2016), performance expectancy with questions 7 to 9 (Shen et al., 2019), self-efficacy with questions 10 to 12 (Venkatesh et al., 2003), and behavioral intention with questions 16 to 18 (Fussell & Truong, 2022). All questionnaires in this study utilized a Likert scale with a five-point scale of grading (from 1 = very low, 2 = low, 3 = moderate, 4 = high, to 5 = very high). The questionnaire was sent to sports management professors to validate its face and content validity. Thirteen professors provided their feedback, and the received comments were incorporated into the questionnaires. The reliability of the research structure was confirmed using Cronbach's alpha and composite reliability (Table 2). Descriptive statistics were employed to analyze the demographic characteristics of the population using SPSS version 27. Hypotheses of the research

were tested using partial least squares structural equation modeling (PLS-SEM) with Smart PLS version 3.2.8.

Results

The research findings were examined and analyzed in two sections: descriptive and inferential. In the descriptive section, the demographic characteristics of the research sample were presented. Table (1) displays the frequency percentages of gender, training experience, virtual reality usage history, and age of the research participants.

Table 1. Demographic characteristics of the sample

Experience of using VR		Coaching experience		Age		Gender	
I haven't used it.	41.6	1-3 years	4.42	20-30	7.07		
I have experienced it a few times.	28.32	4-6 years	10.61	31-40	42.47	Male	69.02
		7-10 years	49.55	41-50	44.24		
I always use it.	28.31	More than 10 years	33.62	51 and above	4.42	Female	29.2

To assess the reliability of the measurement model, three criteria of factor loading, Cronbach's alpha, and composite reliability were used (Table 2). According to the recommendation by (Hair Jr et al., 2014), questions with factor loadings less than 0.4 were excluded from the research model. Subsequently, the analysis was conducted based on the validated questions. Moreover, all variables had Cronbach's alpha values above 0.70 and composite reliability values above 0.80, indicating the model's satisfactory reliability. Additionally, according to (Fornell & Larcker, 1981), the convergent validity of the model was confirmed, as all dimensions of the research had average variance extracted higher than 0.50 (Table 3).

Table 2. Reliability, Convergent Validity, and Factor Loading Assessment of the Research Instrument

Factor	Measurement Items	Factor load	AVE	Rho	CR	α
Performance Expectancy	Using VR for sports training is more effective than using a sports training device.	0.575	0.597	0.742	0.811	0.719
	Using VR for sports training will improve my sports skills more efficiently than using a sports training device.	0.872				
	By expending the same effort as in a sports training device, using VR for sports training will improve the progression of my training.	0.633				
Self-Efficacy	I feel confident in my ability to use VR for sports training.	0.926	0.675	0.857	0.895	0.762
	I feel confident that my sports skills will make training in VR easy.	0.908				
	I feel confident in my sports skills in the realworld environment.	0.586				
Ease of Use	Learning to use VR for sports training will be easy for me.	0.833	0.554	0.785	0.834	0.76
	It will be easy to gain skills for sports training using VR.	0.620				
	Using VR for sports training will make my sports training progression easier.	0.706				
Perceived Usefulness	sports training using VR will be useful for training in the real world.	0.641	0.643	0.841	0.803	0.721
	Using VR would enhance sports training.	0.910				
	Using VR would improve my performance in	0.830				

	sports training.					
Behavioral intention	If made available, I am willing to use VR for sports training.	0.451	0.636	0.829	0.849	0.795
	If made available, I intend to use VR for sports training.	0.918				
	If made available, I intend to benefit from the principles of sports training presented through VR.	0.929				
Enjoyment	Using VR for sports training would be enjoyableu	0.887	0.799	0.923	0.875	0.874
	Using VR for sports training would be exciting.	0.894				
	I enjoy using immersive simulation technology such as VR.	0.901				

The acceptable value for interpreting the results for the composite reliability and Cronbach's alpha is considered to be greater than 0.70. As seen in Table 2, the coefficients for Cronbach's alpha and composite reliability are satisfactory, indicating the appropriate reliability of the research instrument. In the section related to the convergent validity of the research variables, the average variance extracted index was used. The acceptable threshold for this index, according to (Henseler, Ringle, & Sarstedt, 2015), is estimated to be greater than 0.50. In interpreting this and comparing the specified index with the results obtained, the condition of convergent validity between the mentioned variables was observed.

In the assessment of discriminant validity, one of the evaluation criteria in this section is using the variance-based approach, which relies on the heterotrait-monotrait (Fornell and Larcker) matrix (Table 3). Discriminant validity, or discriminative recognition, practically proves the uniqueness of a measurement tool. If there is no or low correlation between the target tool and tools measuring different constructs, the test has discriminant validity. In the presence of discriminant validity, the relationship between the indicators related to different constructs should be very low. The interpretation of this matrix is that the square of the average of one construct should be greater than the square of that construct with other constructs.

Table 3. Discriminant validity (Fornell-Larcker)

Construct	Behavioral Intention	Ease of Use	Enjoyment	Perceived Usefulness	Self-Efficacy	Performance Expectancy
Behavioral Intention	0.798					
Ease of Use	0.611	0.744				
Enjoyment	0.640	0.573	0.894			
Perceived Usefulness	0.576	0.653	0.576	0.802		
Self-Efficacy	0.592	0.548	0.584	0.457	0.821	
Performance Expectancy	0.507	0.535	0.444	0.627	0.421	0.705

The values in the main diagonal of each column should be lower than their values, and if applicable, if the variable in question is not in the first column, it should be higher than the values to their right. Therefore, in such a case, considering Table 3, it can be claimed that the structural model fits in terms of discriminant validity.

Using the criteria of the coefficient of determination (R2), the coefficient of predictive power (Q2), and the significance coefficient (T-values), the structural model of the research has been evaluated (Hair Jr et al., 2014) (Table 5). The R2 ranges from zero to one and indicates the fit of the structural model at three levels: weak (25.0%), moderate (50.0%), and strong (75.0%). In this research, the R2 values for all research variables were above 50.0% (Table 5), meaning that the structural model of the research has a strong fit. In this study, the Q2 criterion was used to

determine the predictive power of the model. The results of Q2 for all dimensions of the current study were above zero. Therefore, it can be said that the research model has predictive power (Table 4).

Table 4. Structural Model Evaluation

Dimensions	R Square	Q^2 (=1-SSE/SSO)
Performance Expectancy	Exogenous Variable	Exogenous Variable
Self-Efficacy		
Ease of Use		
Perceived Usefulness		
Enjoyment		
Behavioral Intention	0.554	0.336

According to (Henseler, Ringle, & Sinkovics, 2009), the SRMR criterion was utilized to evaluate both the measurement and structural models. For SRMR, the recommended value should be less than 0.08, and in this study, it was equal to 0.076.

Table 5. Testing Hypotheses

Hypothesis	Constructs	Path Coefficient	Standard deviation	T statistics	P values
H1	**Ease of Use -> Behavioral Intention**	0.191	0.057	3.364	0.001
H2	**Enjoyment -> Behavioral Intention**	0.285	0.044	6.41	0.000
H3	**Perceived Usefulness -> Behavioral Intention**	0.116	0.05	2.334	0.02
H4	**Self-Efficacy -> Behavioral Intention**	0.22	0.047	4.685	0.000
H5	**Performance Expectancy -> Behavioral Intention**	0.113	0.052	2.189	0.029

The most basic criterion for examining the significance of the relationship between variables is the t-test statistic, or the t-value. If the t-value exceeds 1.96, the relationship is considered significant at the 0.05 level, and if it exceeds 2.58, it is considered significant at the 0.01 level. As indicated in Table 5, the t-values of the research variables demonstrate that all research hypotheses are statistically significant (T-Value > 1.96). Additionally, using the structural equation modeling and partial least squares method, the path analysis results indicate that perceived usefulness, enjoyment, performance expectancy, self-efficacy, and ease of use have positive and significant effects on behavioral intention. Finally, the relationships between the components of the research model are illustrated as follows (Figure 2).

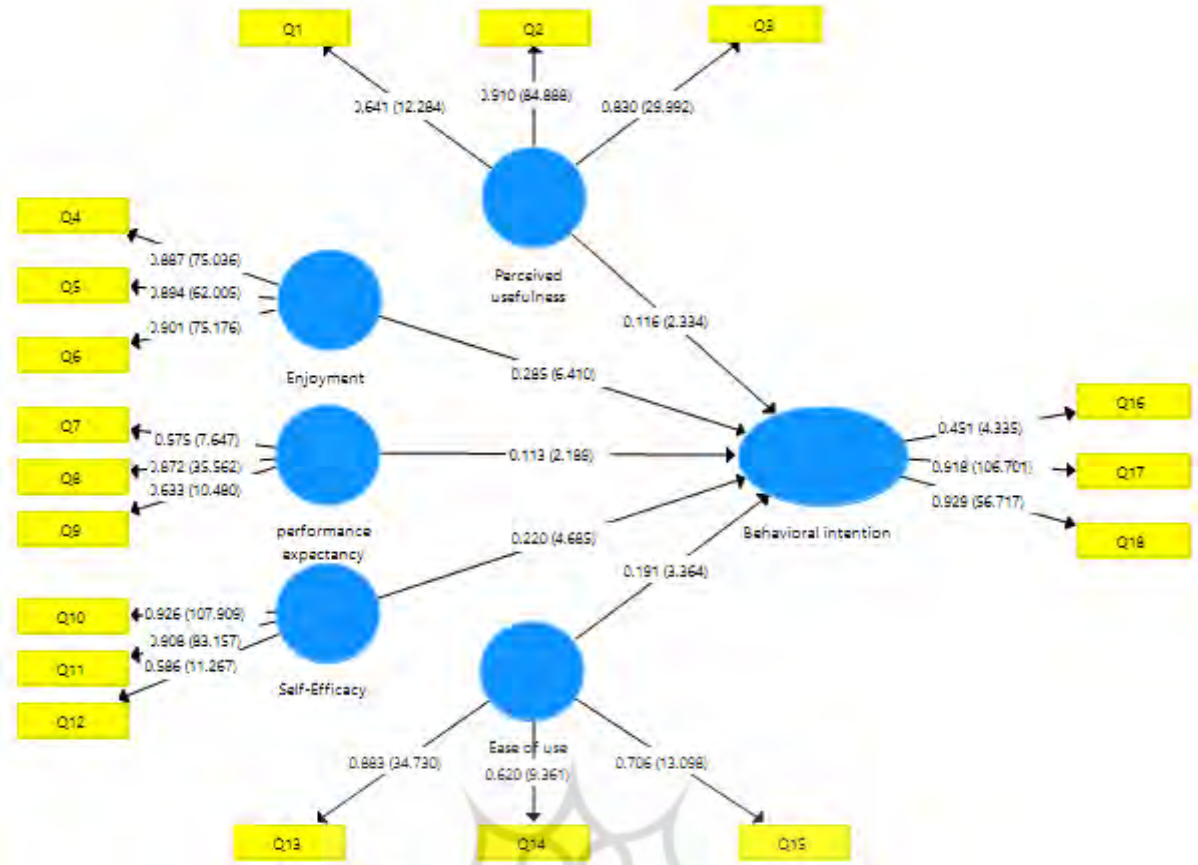

Figure. 2. T value and Factor load for research model

Discussion and Conclusion

This study has been conducted on coaches, examining the analysis of factors influencing the behavioral intention to use virtual reality technology in sports coaching. According to the results of this research, it was found that perceived usefulness of virtual reality technology has a positive and significant effect on the intention to use virtual reality in sports coaching (behavioral intention). The results of this hypothesis are consistent with the studies by Yang and Han (2021), Wicaksono and Maharani (2020), and khoddami, norouzi, and MOROVATI (2018). In this context, perceived usefulness of virtual reality implies that individuals have been able to benefit from the strengths and features of virtual reality technology, enabling them to perform their intended behaviors with greater confidence. The use of virtual reality in sports coaching can enhance interaction between coaches and athletes (Makransky et al., 2019). Athletes, as more active participants in virtual environments, show better focus on exercises. Virtual reality allows coaches to design various exercises based on the type of sport and the needs of athletes, providing immediate feedback to coaches (Oagaz et al., 2021). By creating competitive and exciting environments, virtual reality can contribute to increasing motivation and the desire for growth and progress, encouraging athletes to make more effort (Lin & Yeh, 2019). Therefore, to optimize the use of this technology, a virtual reality-based educational system can be created, incorporating engaging and realistic exercise routines.

The study results also revealed that enjoyment has a positive and significant impact on the intention to use virtual reality in sports coaching. This finding aligns with the results of studies by Kang, Dove, Ebright, Morales, and Kim (2021), Dieck, Dieck, and Jung (2021), and Abasi and Farhadi (2023). Enjoyment for individuals can act as a motivational factor for actively participating in activities and exercises in virtual reality. Virtual reality provides coaches and athletes the opportunity to train in engaging and diverse environments. This diversity enhances the pleasure of sports activities in this environment. Moreover, the immersive experience of advanced features in virtual reality increases enjoyment and the inclination to participate further (Abich IV et al., 2021).

Therefore, to attract attention and create more enjoyment in athletes, developers can create engaging and diverse educational content in virtual reality. This content can include exercises, competitions, sports games, and exciting virtual reality experiences. The difficulty level of exercises in virtual reality can be adjusted over time, challenging athletes with exercises corresponding to their skills as they progress.

The path analysis results indicate that performance expectancy has a positive and significant impact on the intention to use virtual reality in sports coaching. This finding is consistent with the studies by Rejón-Guardia, García-Sastre, Orfila-Sintes, and Garau-Vadell (2020), Shen et al. (2019), and Hwang and Moon (2017). In this context, performance expectancy in virtual reality means that athletes' expectations of the performance and outcome of the virtual reality environment have a meaningful effect on their intention to actively participate in this technology and engage in exercises. Additionally, athletes and coaches expect that using virtual reality will provide a suitable educational experience for improving skills and performance (McCosker et al., 2022). These experiences must be technically and tactically useful and practical to ensure continuous user interest in using this technology. Developers can create engaging and useful educational content for virtual reality, incorporating high-quality graphics, sound, and advanced features to positively influence the intention of athletes and coaches to participate actively in virtual reality.

Furthermore, it was identified that self-efficacy has a positive and significant impact on the intention to use virtual reality in sports coaching. This result aligns with studies by Gillespie, Farra, Regan, and Brammer (2021), Y.-C. Huang, Backman, Backman, McGuire, and Moore (2019), H.-M. Huang and Liaw (2018), and Mousavi et al. (2019). Self-efficacy in virtual reality implies that athletes' belief in their ability to perform exercises in the virtual reality environment has a meaningful influence on their intention to use this technology and engage in exercises. When athletes have confidence in their self-efficacy and feel they can succeed, the likelihood of their willingness to participate in virtual reality and exercises in this environment increases. Virtual reality, by creating more realistic and useful experiences, can contribute to enhancing athletes' and coaches' self-efficacy in using this technology. When athletes feel they can successfully use virtual reality, their motivation and willingness to participate increase. Therefore, by addressing the needs of athletes, improving the user experience of virtual reality can enhance self-efficacy and the inclination to participate in this technology. For example, creating more accurate guides, providing better feedback, and combining challenging and exciting competitions can strengthen self-efficacy and the willingness to participate in virtual reality.

The results also demonstrate that ease of use has a positive and significant impact on the intention to use virtual reality in sports coaching. This finding is supported by research studies by Kang et al. (2021), Dieck et al. (2021), and Yang and Han (2021). In this context, when athletes feel that using virtual reality is easy and trouble-free, their motivation to participate and exercise in this technology increases. Virtual reality must be presented with simple user interfaces and practical usability. This ensures that athletes and coaches can easily use this technology without the need for effort and time to learn how to use it (Davis et al., 1989). Coaches and developers can ensure that the necessary equipment and tools for using virtual reality are readily available to athletes. This will increase ease of use and the inclination to participate in this technology. Additionally, developers can enhance the user interface and user experience in virtual reality, providing a sense of ease and comfort for athletes. This enhancement may include increasing system response speed and providing easy access to various features and capabilities.

In conclusion, the use of virtual reality in sports coaching demonstrates that this technology can be a powerful and effective tool for improving the learning experience of athletes, increasing enjoyment, and promoting more active and better participation in sports activities. The results of this study show that using virtual reality allows athletes and coaches to design various exercises and environments based on the type of sport and athletes' needs. By creating competitive and exciting environments, virtual reality can contribute to increasing motivation and the desire for growth and progress, encouraging athletes to participate more actively in sports activities and exercises. A diverse and exciting experience in virtual reality enhances pleasure in actively participating in sports activities and exercises. Athletes expect that using virtual reality will provide a useful and practical educational experience that is technically and tactically applicable. The belief of athletes in

their ability to perform exercises in the virtual reality environment positively influences their intention to use this technology and can increase their willingness to participate in it continuously. Overall, it can be said that the use of virtual reality in sports coaching can be recognized as a powerful tool for improving athletes' learning experience, increasing enjoyment, and promoting more active participation in sports activities. Considering the results of this study, developers and coaches can create high-quality and engaging content that continuously attracts athletes and allows them to benefit from this technology. Additionally, attention to ease of use and improvements in the user interface and user experience can better encourage individuals to use virtual reality and achieve their educational and sports goals.

This research, like any other, has certain limitations. First, this study examines a number of factors for the acceptance of virtual reality in sports coaching. Future researchers may investigate other factors based on technology acceptance models. Additionally, this research utilizes a cross-sectional model for assessing the proposed model; future studies can benefit from specific case studies in specialized sports fields.

Acknowledgement

The authors acknowledge all the people who cooperated in this research.

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