Let's play: Me and my AI-powered avatar as one team[1]

Asad H. Butt[a] | Hassan Ahmad[a] | Muhammad A. S. Goraya[b] | Muhammad S. Akram[c] | Muhammad N. Shafique[d]

[a]*School of Business Administration, Dongbei University of Finance and Economics, Dalian, China*
[b]*Portsmouth Business School, University of Portsmouth, Portsmouth, England*
[c]*Essex Business School, University of Essex, Colchester, UK d*
[4]*Department of Business Administration, Gomal University, Khyber Pakhtoonkhwa, Pakistan*

Abstract
Artificial Intelligence (AI) tools have altered the gaming industry, thanks to their newly incepted functionalities which have enhanced the consumer experience. Building on innovation diffusion theory, technology acceptance model, and flow theory, this study highlights the concept of an AI-powered avatar. This study explores the roles of perceived easiness, usefulness, advantage, compatibility, enjoyment, customization, and interactivity in forming the gamers' intention to play with AI-powered avatar. A survey data of 500 respondents, from China, having an experience of playing online video games is used to test the proposed hypotheses. The results offer significant support to the proposed relationships related to the adoption of an AI-powered avatar and the consumers' psychological association with its adoption. Consequently, the reults imply that AI-powered avatars should allow gamers to customize, interact, and take assistance to move up levels with an enjoyable experience. Moreover, this study also suggests that digital technologies such as, AI could be integrated into the gaming environment for a more pleasing and immersive experience.

Keywords: AI-powered avatar, customization, interactivity, AI adoption, interactive gaming

1. Introduction

The gaming industry has recently been transformed by the introduction of innovative technologies (Ghazali, Mutum, & Woon, 2019). Consequently, the revenues from online gaming have increased tremendously (Teng, 2017), and it is predicted that this industry will develop into a multi-billion dollar international industry (Werder et al., 2020). In particular, innovative technologies such as Artificial Intelligence (AI), Augmented Reality (AR), and Virtual Reality (VR) are transfiguring the gaming industry (Butcher, Sung, & Raynes-Goldie, 2019; Butcher, Tucker, & Young, 2020). AI has gone far beyond simple algorithms or computations, and it has subsequently changed the gaming environment with better AI combinatorial game theory (Fujita & Wu, 2012). The introduction of AI in gaming has helped game developers to create a relationship with the consumer through advanced realistic graphics, human-like avatars, scenarios, and storylines (Yannakakis & Togelius, 2018). AI is becoming an integral part of massively multiplayer online role-playing games (MMORPG), role-playing games (RPG), and massively multiplayer online (MMO) games through its extensive advanced features, which fully immerse the gamer inside the game (Westera et al., 2020). Gamers wish to take advantage of new technologies that are compatible with their attitude and psychological behavior. Furthermore, the extant literature has provided positive results towards adopting new technology if it is perceived to compatible and having a relative advantage over its predecessor (Chang, Liu, & Chen, 2014).

[1] Butt, A. H., Ahmad, H., Goraya, M. A. S., Akram, M. S., & Shafique, M. N. (2021). Let's play: Me and my AI-powered avatar as one team. Psychol Mark, 1–12. https://doi.org/10.1002/mar.21487

In the last decade, AI has completely transformed conventional technology to a whole new level of digitalization (Bakpayev, Baek, van Esch, & Yoon, 2020; Dwivedi et al., 2019; Xu, Shieh, van Esch, & Ling, 2020). AI is the key to empower a machine to behave like a human but with the powerful algorithms and machine learning techniques to foresee environmental changes (Nilsson, 2009). AI has created value in many different fields, and it enhances business performance and functionality (Duan, Edwards, & Dwivedi, 2019). By 2022, AI is expected to have massive investments in different industries, such as retail (Oosthuizen, Botha, Robertson, & Montecchi, 2020; Pillai, Sivathanu, & Dwivedi, 2020). The concept of AI in-game design is to create an immersive and interactive experience for the player. The game elements—such as storylines, avatar, the music and tones, scenarios, and so forth—affect the player's behavioral and cognitive understanding. The concept of an AI-powered avatar is unique and is investigated for the first time. Hence, the ease of use and usefulness of AI tools in the gaming environment could assist the gamer. The previous studies have highlighted that a technology that can provide benefit and ease of use positively influences attitude (Li, Chung, & Fiore, 2017).

There is still no formal definition of an AI-powered avatar in the literature. Hence, in this paper we explain the concept of an AI-powered avatar. Our work is informed by the previous literature of AI and gaming (Kaplan & Haenlein, 2019; Xu et al., 2020). An AI-powered avatar is defined as ‘a human-like avatar that thinks, acts, and interacts with the gamer during the gameplay to augment the game performance.’ AI context-specific variables—such as interaction, enjoyment, and customization—are the key ingredients of an AI-powered avatar. Hence, using an AI-powered avatar will give the end user that ability to interact with the avatar and customize the gameplay conferring to their prerequisite for better game performance. A positive attitude is a vital aspect of adopting new technology (Buunk & Dijkstra, 2011). Hence, the gamer’s attitude towards an AI-powered avatar will play a key role in its adoption. AI integration in the latest game designs is crucial for the complex game dynamics and structures. Consequently, game developers incorporate AI-based elements for the players' game experience (Rabin, 2013). In this study we focus on understanding the user’s intention to play with an AI-powered avatar. The previous literature has focused on the technological, behavioral, and physiological aspects of an avatar with a human personality. However, there is a gap in understanding the gamers’ intention to use an AI-powered avatar because it is a new concept with interactive and customizable functions. A previous study in the context of AI has highlighted enjoyment, interactivity and customization as key ingredients towards technology adoption (Pillai et al., 2020). This study will highlight this gap by focusing on the benefits, compatibility, ease of use, and usefulness with AI context-specific variables. Furthermore, our study aims to address the following research questions from the perspective of AI tools:

RQ1: *Do gamers have the intention to use the AI-powered avatar?*
RQ2: *Can AI context-specific variables highlight the behavioral aspects of the gamer?*

This study will have implications for the business sector in terms of improving game development outcomes (Kumar, Rajan, Venkatesan, & Lecinski, 2019; Nielsen & Lund, 2019). Furthermore, business operations have improved and integrated with AI (Ransbotham, Gerbert, Reeves, Kiron, & Spira, 2018; Tarafdar, Beath, & Ross, 2019). The gaming industry is a billion dollar market that is booming, and many innovative technologies have recently been introduced. AI elements in the game design have been amended significantly (Lewis & Dill, 2015). The chatbot concept in AI is a component that interacts with humans via natural conversational language (Przegalinska, Ciechanowski, Stroz, Gloor, & Mazurek, 2019). AI technology and machine learning can engage users to interact automatically (Araujo, 2018). This integration gives the idea of an AI-powered avatar who converses with the gamer and guides them through the game. A natural conversational-language AI element has previously been studied in the case of chatbots (Hill, Ford, & Farreras, 2015; Kannan & Bernoff, 2019; Przegalinska et al., 2019).

An AI-powered avatar is an exciting concept, and avatar identification has already been considered by previous studies (D. Black, 2017; Y. Kim & Sundar, 2012). An AI-powered avatar can give users a fascinating interactive experience when they converse and play with their avatar. The AI-powered concept can create a sense of bonding between the gamer and the avatar. Natural-language chatbots have provided social relationships, answered queries, and provided information (Chung, Ko, Joung, & Kim, 2018; Howard & Borenstein, 2020). From this perspective, an AI-powered avatar may have the ability to create a strong relationship between the avatar and gamer because it will be responsive and interactive.

The concept of adaptive gameplay has been previously used in the game designs to better match players with the same skill set (Herbrich, Minka, & Graepel, 2007). Game design will be entirely transformed when AI components are introduced. In the future, the AI-powered avatar concept could play a key role in furthering the adoption of interactive online games. Thus, AI components—such as natural-language processing (NLP)—have given game developers the opportunity to input these ideas in the gaming environment (Yannakakis & Togelius, 2018). The rest of this paper is structured as follows. The literature review will help to develop a conceptual framework for AI-powered avatar gaming. This will be followed by a description of the research methodology and the data analysis. Then, the results will be discussed. Finally, this paper will describe the limitations that have been observed, it will give some directions for future research, and it will then draw a conclusion.

2. Literature Review and Theortical Framework

2.1 IDT: Perceived Relative Advantage (PRA) and Compatibility (COMP) of an AI-powered Avatar

Innovation diffusion theory (IDT) explains how consumers are willing to make behavioral changes when adopting new technologies (Douglas, Overstreet, & Hazen, 2016; Rogers, 2010). In this study, we are focused on the perceived relative advantage (PRA) and compatibility (COMP) dimension of IDT (Rogers, 2010). The gamers wish to have unique benefits while playing with their avatar because it will help them to move swiftly through the levels with less effort (Liao, Cheng, & Teng, 2019). Furthermore, the avatar's compatibility with their personality will enhance their performance, as explained in previous studies (Jin, 2010; Teng, 2017). Hence, the concept of an AI-powered avatar will provide a competitive edge to the gamer in terms of customization, interactivity, and enjoyment. IDT can further offer innovative characteristics to gamers who wish to adopt new technology (Rogers, 2010; Talwar, Talwar, Kaur, & Dhir, 2020). This study of AI-powered avatar with IDT can give insights into consumers in terms of how they perceive this phenomenon and how ready they are to adopt it. Relative advantage provides us with a description of how innovative technology is better (Engelman, Fracasso, Schmidt, & Zen, 2017; Tung, Lee, Chen, & Hsu, 2009). Thus, an AI-powered avatar in the gaming environment may be useful to the users. Figure-1 represents the conceptual framework of this study.

Users tend to use a product or service again if it matches their habitual needs or wants and can fulfill their values. This idea is categorized as compatibility, which is a dimension of innovation diffusion theory (Song, Drennan, & Andrews, 2012). Consumers in gaming face problems that are related to moving out of a problematic level or they may sometimes be unable to complete the gameplay activity. Consequently, they need assistance in the form of virtual in-game items that can enhancement the value of their avatar (Park & Lee, 2011). Thus, having such an AI-powered avatar can create a strong link between the game character and the gamer's personality. Therefore, an AI-powered avatar can be help the gamer by offering guidance, and by improving their performance, speed, and combat. Therefore, we propose the following hypotheses:

H1a: *The perceived relative advantage of an AI-powered avatar will positively influence its perceived ease of use.*
H1b: *The perceived relative advantage of an AI-powered avatar will positively influence its perceived usefulness.*
H2a: *The compatibility of an AI-powered avatar will have a positive influence on its perceived ease of use.*
H2b: *The compatibility of an AI-powered avatar will have a positive influence on its perceived usefulness.*

2.2 TAM: Perceived Ease of Use (PEU) and Perceived Usefulness (PU) of AI-powered Avatar

TAM theory has been used many times to help the adoption of a new technology (Crittenden, Crittenden, & Ajjan, 2020; Stern, Royne, Stafford, & Bienstock, 2008; Zhang & Mao, 2020). TAM theory has provided academics and managers with many useful insights about consumer behavior related to the personality's emotional and cognitive elements (Lin, Shih, & Sher, 2007; Vahdat, Alizadeh, Quach, & Hamelin, 2020). Hence, this study will investigate if the gamers feel that they are well connected to the concept of an AI-powered avatar, and if it can provide them with ease and usefulness during the gameplay. TAM is now used with other theories to give more useful details about consumer behavior, such as TAM and IDT (Patel, Das, Chatterjee, & Shukla, 2020; Tung et al., 2009), TAM and TPB (Rahman, Lesch, Horrey, & Strawderman, 2017) and so forth. Ultimately, consumers use a product or service if they find it easy and useful for their benefit.

An AI-powered avatar must be easy to use and also beneficial for the gamers. In gaming, a gamer may often come to a situation where they are obstructed and cannot pass the level. An innovative AI tool, the "AI-powered avatar," may be able to transform the gamer by offering them aid or assisting them to the next level by providing customization and interactivity. We know that the consumers wish to aid themselves with all the benefits and usefulness that they can find during difficult situations. Some examples during gameplay include avatar decoration (H. Wang, Ruan, Hsu, & Sun, 2019), in-game purchases (King & Delfabbro, 2019), or avatar influences for exergames as a motivational tool (Peña & Kim, 2014). Hence, we can assume that an AI-powered avatar can be a useful tool for interactive gameplay. In addition, the gamer may adopt a positive attitude towards adopting technology or services in gaming through avatar use (Kim & Sundar, 2012; Wang et al., 2020). Positivity during the gameplay with AI tools can lead to a positive attitude towards the game and its avatar. Therefore, we propose the following hypotheses:

H3: *Perceived ease of use of an AI-powered avatar will have a positive influence on gamers' attitude toward AI-powered avatar.*
H4: *Perceived usefulness of an AI-powered avatar will have a positive influence on gamers' attitude toward AI-powered avatar.*

2.3 Attitude toward AI-powered avatar

Users' attitude is defined as an individual's emotional and cognitive state of mind towards behavioral intentions (Chou, Chu, & Chiang, 2020; Ho, Lwin, Sng, & Yee, 2017). A positive attitude has been shown to have an impact on the consumer's purchase intentions in a different context (Buunk & Dijkstra, 2011; Mazurek & Małagocka, 2019). In the gaming environment, attitude has been shown to play a significant role in affecting the consumer's purchase intentions (Park & Lee, 2011). We can assume that a gamer will develop a positive attitude towards an AI-powered avatar if it helps them to develop a positive attitude during use and also if it is convenient. Attitude is an essential element in the gaming environment and it has been found to be positive in different aspects, such as exergames (Lwin & Malik, 2012) and so forth. With a positive attitude, gamers can also develop a pleasurable experience to adapt to new technologies (Liao et al., 2019; Trepte & Reinecke, 2010). Furthermore, a positive attitude towards a particular technology can make consumers purchase or adopt the technology. Thus, an AI-powered avatar may influence the consumers to adopt it if it is convenient and easy to use for the gamer. Therefore, we propose the following hypothesis:

H5: *The gamers' attitude toward an AI-powered avatar will have a positive influence on their intention to play with AI powered avatar.*

2.4 Perceived Enjoyment (PENJ) of AI-powered Avatar

Enjoyment is perceived as a fun or entertaining value during an activity (C. Y. Chou & Sawang, 2015; Patel et al., 2020). The literature has established that users who experience enjoyment during gameplay have improved purchase intentions (Jang & Park, 2019). The enjoyment value is one of the most crucial factors in defining consumer motivation, and it has been established in the gaming environment (McGloin, Farrar, Krcmar, Park, & Fishlock, 2016). We predict that an AI-powered avatar will provide the gamer with an immersive and pleasurable experience because of its interactive and customizable functions. Enjoyment is an essential predictor in influencing consumers to adopt or make a purchase in the gaming environment (Hopp & Fisher, 2017).

Thus, enjoyment may be a strong construct in the end user's adoption of an AI-powered avatar. Good experience and positive feelings with a particular technology can create an entertainment value for the end user. Therefore, we expect that when users have an enjoyable experience using an AI-powered avatar, they will feel more satisfied and will feel more pleasure. Thus, enjoyment is an essential measure for understanding consumer behavior towards the adoption of new technology. An AI-powered avatar will have an enjoyment value for the gamers in this regard. Therefore, we propose the following hypothesis:

H6: *Perceived enjoyment of an AI-powered avatar will have a positive influence on gamers' intention to play with AI powered avatar.*

2.5 Perceived Customization (CUST) of AI-powered Avatar

This is an aspect where consumers can modify their current situation according to their needs and wants (Sparks & Chung, 2016). Customization is a component that provides consumers with the ability to alter the position according to their preferences (Herrmann, Hildebrand, Sprott, & Spangenberg, 2013). Customization is an essential element and it can provide usability, convenience, and improved performance (Kim, Chen, & Zhang, 2016). The gaming environment's customization aspect can provide personalization to the end user and positively affect the consumer's purchase intentions (Danckwerts & Kenning, 2019; Wottrich, Verlegh, & Smit, 2017). The customization function in an AI-powered avatar can help gamers to use different in-game features during gameplay.

Another study has provided insights that the gaming environment's customized situations serve as a motivational factor for the gamers (Yee, 2006). An AI-powered avatar with the ability to be customized by the gamer may positively influence its adoption and further purchase intentions for in-game features. Another study has shown that customization during a sports game can influence consumers towards brand use (Hang & Auty, 2011). Therefore, we predict that an AI-powered avatar with customizable features will enhance the consumer's immersive experience and positive adoption. Thus, we propose the following hypothesis:

H7: *Customization of an AI-powered avatar will positively influence on gamers' intention to play with AI powered avatar.*

2.6 Perceived Interactivity of an AI-powered Avatar

The concept of perceived interactivity (PINT) explains that users can participate in the modified or customized content of a mediated environment in real-time (Fiore, Jin, & Kim, 2005; Van Kerrebroeck, Brengman, & Willems, 2017). The interactivity element in any situation can give the end user to experience a firm's belief about the product or service, and their positive engagement feelings towards it (Hwang, Oh, & Scheinbaum, 2020; Su, Comer, & Lee, 2008). AI interactivity can allow consumers to interact with the product or service and it can give them further guidance through product prices, information, and discounts (Pillai et al., 2020). An AI-powered avatar can improve interactivity and it enables the gamer and avatar to interact, react, and respond to each other to move swiftly to the next level during gameplay. The AI interactivity element has been elaborated on in previous studies (Pantano & Pizzi, 2020). Interactivity in AI-powered avatars may be able to influence the consumer to adopt this new technology. Thus, an AI-powered avatar can provide consumers with the ability to interact with their customized avatar in the gameplay to enhance performance and improve their results. Therefore, we propose the following hypothesis:

H8: *Perceived interactivity of AI-powered avatar will influence on gamers' intention to play with AI powered avatar.*

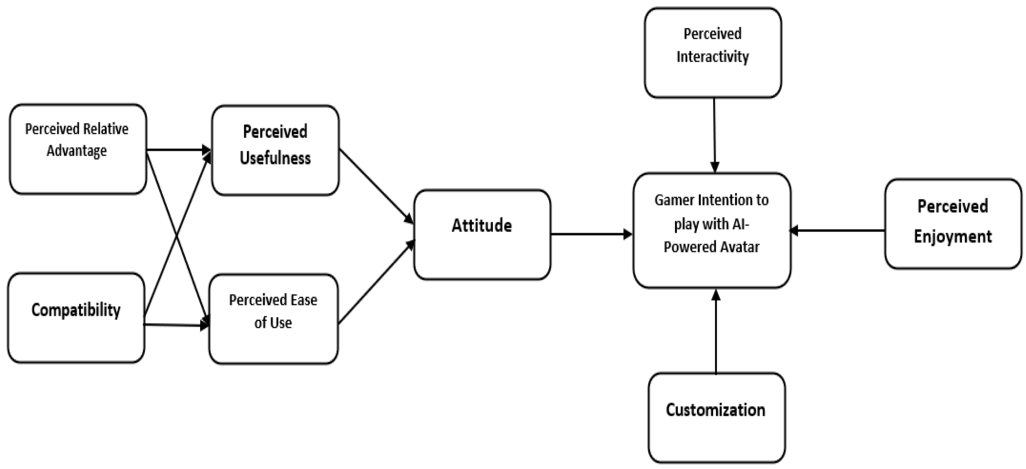


Figure-1 Conceptual framework of AI-powered avatar

3. Methodology

This study adopts a cross-sectional research format. The sample was collected from the urban city of Dalian, China. A total of 527 responses were received for the data collection. After data screening, 27 of the answers were removed due to invalid replies and duplicated responses. The respondents for the current research study have had the experience of playing MMORPG or RPG games on their smartphones and personal computers. We wanted to collect data from the experienced gamers rather than the non-experienced of the novel gamers. The reason for choosing experience gamers is that they can provide better insights towards adopting an AI-powered avatar. The online survey was administered by distributing them on different social media platforms in China. During the data collection, we made sure that the responses came from Dalian. Consequently, the online survey distribution on social media platforms was done in the Dalian zone to get maximum coverage.

Social media websites such as WeChat, Weibo, and Teiba were used to collect data, while keeping in mind that the data collection is mainly from Dalian, China. The respondents were briefed about the concept of an AI-powered avatar to improve their understanding, while we responded to the questions related to the conceptual framework. The sample size includes both male and female respondents. The respondents were mostly students because this study focused on gathering data from the youngsters as they are more attached and connected to the gaming world (Butcher et al., 2020). In total, 79% of our respondents were gamers aged between 21-25, whereas the second largest group at 15% was aged between 15-20. The respondents were mostly undergraduate students. The responses showed that the majority spend 1 -2 hours on gaming every day, while others, at least 20% of the respondents, spent 3-4 hours and 5-6 hours daily. Hence, the experienced gamers can provide better insights towards adopting an AI-powered avatar in the gaming format (see Table-A in the web-appendix for demographic details).

4. Data Analysis and Measurement Model

4.1 Common Method Bias

Expert researchers and statisticians developed different measures to test whether or not common method bias exists in the research (Fornell & Bookstein, 1982; Schwarz, Rizzuto, Carraher-Wolverton, Roldán, & Barrera-Barrera, 2017). These measures include the confidentiality of study respondents, simplifying survey questions, and providing complete guidelines to respondents to avoid bias and survey methodology errors. In this study, following Zafar, Qiu, Li, Wang, and Shahzad (2019), we tested common method bias using full collinearity of constructs. We have calculated the inner VIF of all constructs by treating each variable as dependent one-by-one, as indicated by Kock (2015). All of the VIF values are lower than the threshold of 3.3 (see Table-B in the web-appendix). This robustly proves that this study is not contaminated by common method bias.

4.2 Outer Measurement Model

Hair, Sarstedt, Ringle, and Gudergan (2017) stated that the outer measurement model intended to measure the internal consistency, discriminant validity, and convergent validity of constructs. Reliability tests are used to assess the consistency and validity of constructs measured through convergent validity and discriminant validity (Hair, Sarstedt, Ringle, & Mena, 2012). The construct reliability illustrates the variance caused by a variable and factor loading used to confirm the construct's reliability and related items. The threshold level for factor loadings is 0.60: factor loadings meeting the standard of 0.60 indicate that the construct items serve the purpose and measure what is intended to measure (Wynne W Chin, 1998; Hair, Ringle, & Sarstedt, 2011). Table-1 shows the reliability and validity of the constructs and AVE of this study. Cronbach's alpha and composite reliability further validate the reliability of constructs. The values illustrated in Table-1 surpass the standard criteria suggested by Nunnally and Bernstein (1994).

Table-1; Factor Loadings and Variance Inflation Factor

Constructs and Items	Factor Loadings	VIF
Attitude	α=0.751, CR=0.855, AVE= 0.663	
Using an AI-powered avatar will be a good idea in gameplay	0.791	1.238
Using an AI-powered avatar will be a wise idea in gameplay	0.839	2.077
I like the idea of playing with an AI-powered avatar	0.812	2.001
Compatibility	α=0.818, CR=0.891, AVE= 0.732	
Using an AI-powered avatar will be compatible with the way I want to play	0.856	1.684
Using an AI-powered avatar will fit well with my gaming requirements	0.890	2.159
Using an AI-powered avatar will be compatible with all the aspects of gameplay features	0.820	1.837
Customization	α=0.769, CR=0.860, AVE= 0.673	
AI-powered avatar will fulfill my gaming needs	0.799	1.201
AI-powered avatar will enable me to buy in-game features according to my gaming requirements	0.833	2.837
I believe I will be able to customize AI-powered avatar the way I want it to be	0.828	2.820
Gamer Intention to Play AI-powered Avatar	α=0.858, CR=0.914, AVE= 0.780	
I will use an AI-powered avatar in the future	0.906	2.585
I am willing to use an AI-powered avatar to fulfill my gaming needs	0.867	2.019
I am willing to recommend AI-powered avatar to other gamers	0.875	2.125
Perceived Enjoyment	α=0.858, CR=0.898, AVE= 0.638	
It will be a fun and pleasurable experience to play with an AI-powered avatar	0.765	1.882
AI-powered avatar features will be exciting in the gameplay	0.808	2.105
I will enjoy playing the game more with an AI-powered avatar	0.806	1.884
I believe an AI-powered avatar will take me to the next level of excitement in gameplay	0.822	2.065
I believe I will be completely absorbed in the gameplay while playing with an AI-powered avatar	0.791	1.756

Perceived Ease of Use	α=0.886, CR=0.917, AVE= 0.688		
Using an AI-powered avatar will not require much effort		0.744	1.709
It will be easy to understand the AI-powered avatar features		0.834	2.186
It will be easy to make my AI-powered avatar do what I want it to do		0.863	2.605
It will be easy to learn the features of AI-powered avatar during the gameplay		0.861	2.540
Overall, the experience to play with an AI-powered avatar will be easy for me		0.841	2.237
Perceived Interactivity	α=0.814, CR=0.871, AVE= 0.575		
AI-powered avatar will enable me to see the gameplay from a different perspective		0.699	1.502
AI-powered avatar will help me to interact with the game situation more quickly		0.753	1.793
AI-powered avatar will have features that can offer me information and guidance for combat in the gameplay		0.828	2.039
AI-powered avatar will be an engaging tool for the gamers		0.731	1.582
AI-powered avatar will be a dynamic tool for the gamers		0.774	1.724
Perceived Relative Advantage	α=0.924, CR=0.943, AVE= 0.767		
Compared to a conventional avatar, an AI-powered avatar will improve the quality of gameplay		0.837	2.322
Compared to a conventional avatar, an AI-powered avatar will give me greater control over my gameplay		0.890	3.383
Compared to a conventional avatar, an AI-powered avatar will give me more access to in-game features		0.898	3.575
Compared to a conventional avatar, an AI-powered avatar will enable me to play in a more convenient way		0.896	3.293
Compared to a conventional avatar, an AI-powered avatar will enhance my overall gameplay experience		0.855	2.781
Perceived Usefulness	α=0.906, CR=0.930, AVE= 0.728		
Using an AI-powered avatar will enable me to move swiftly during the gameplay		0.792	1.893
Using an AI-powered avatar will make it easier for me to adapt quickly to the changes during the gameplay		0.852	2.497
I believe using an AI-powered avatar will be a useful option in the game		0.865	3.074
Using an AI-powered avatar will help me to move up quickly in the game levels		0.884	3.423
Using an AI-powered avatar will improve my gameplay efficiency		0.871	2.672

α=Cronbach's Alpha, CR=Composite Reliability, AVE= Average Variance Extracted

The Fornell-Larcker criterion and HTMT (Hetrotrait Monotrait) are used to assess the discriminant validity of the constructs. Table-C (see the web-appendix) illustrates the Fornell-Larcker criterion results. All of the values of the square root of AVE (values in Bold) are higher than the corresponding correlation values in the same column, which proves the discriminant validity of all constructs of the model (see Table-C in the web-appendix).

The discriminant validity of the constructs is further validated through a robust measure that was developed by Henseler and Sarstedt (2013), which is called the HTMT ratio and is based on the Monte Carlo simulation. The HTMT ratio is based on interconstruct correlation, and the threshold value is 0.90. All HTMT values are lower than the standard value of 0.90 and they validate the discriminant validity of constructs (see Table-D in the web-appendix). Figure-A in the web-appendix provides the measurement model results.

4.3 Inner Structural Model

After testing and validating the reliability and validity of the measurement model, the next step is to assess the inner structural model, which is intended to validate the model's hypothesized relationship. The inner structural model is based on path coefficients, the significance of path coefficients, the goodness of fit (GOF), coefficient of determination (R^2), Effect Size (f^2), and predictive relevance (Q^2).

4.3.1 Path Coefficients and Significance

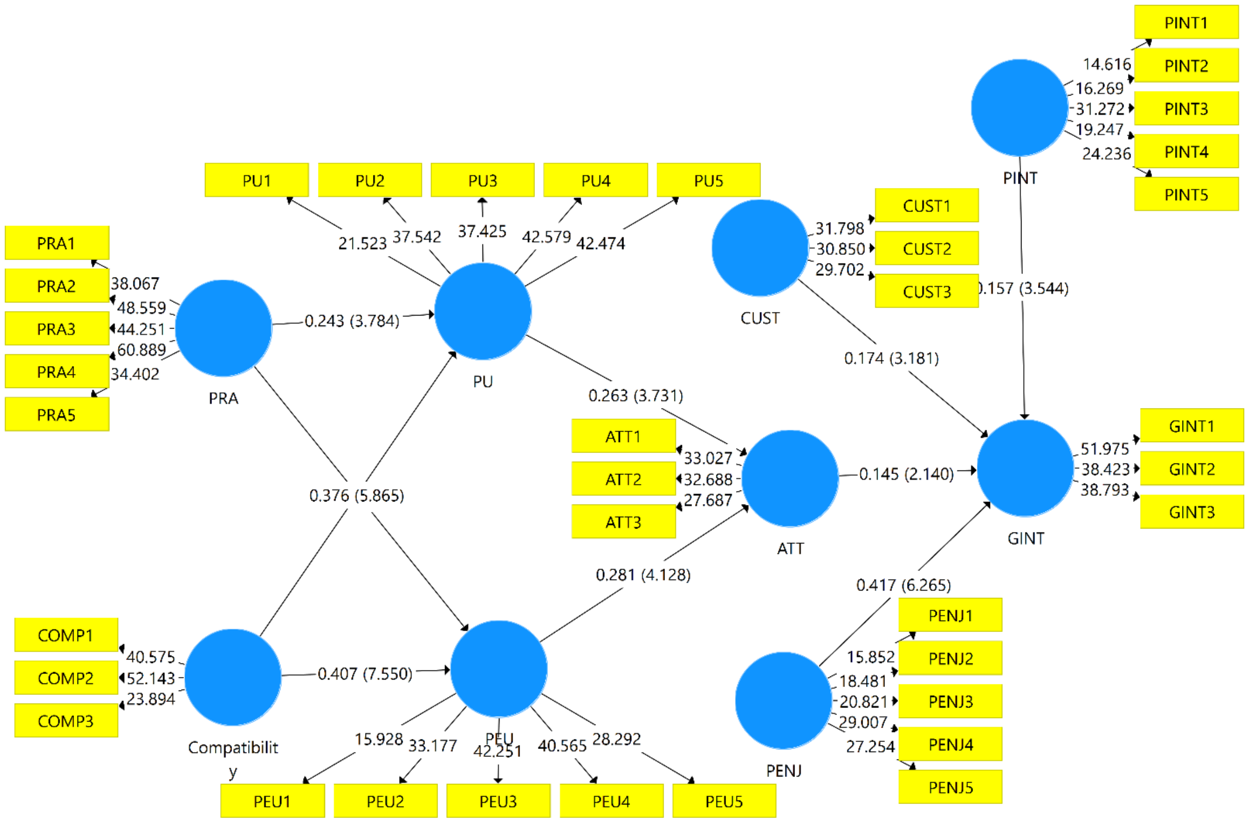
The beta coefficient in simple regression and path coefficient in PLS-SEM are alike. The path coefficient or beta coefficient assesses the unit variation in the endogenous variable caused by an exogenous variable and provide empirical grounds to accept or reject the hypothesis. The higher value of the coefficient indicates the more substantial effect of that particular variable. However, the beta coefficient alone is not enough to decide on hypothesis acceptance or rejection, the coefficient's significance must be assessed along with the coefficient value. Meanwhile, the importance of the relationship evaluated through T-statistics. T-statistics and beta coefficients has been obtained by using the bootstrapping method, as suggested by Chin, (1998). The results of the regression models are illustrated in Table-2.

4.3.1.1 Hypothesis Testing

Table-2 illustrates the regression analysis results, and provides insights into the direct relationship between independent and dependent variables. The first direct relationship proposed in H1a is the positive and significant relationship between perceived relative advantage and perceived ease of use, which is supported by the results (β=0.298, T-Stat=4.986, p<0.001); therefore, H1a is accepted robustly. In H1b, we proposed a positive and significant relationship between perceived relative advantage and perceived usefulness. The results also provide support to H1b, as depicted by the values of different indicators (β=0.243, T-Stat=3.784, p<0.001). The results also provide support for H2a (β=0.407, T-Stat=7.550, p<0.001). In H3a, we proposed a direct positive relationship between compatibility and perceived ease use. In H2b, we observed a positive relationship between compatibility and perceived usefulness, and the results provided support for H2b (β=0.376, T-Stat=5.865, p<0.001). H3 proposed a positive and significant relationship between perceived ease of use and attitude. The results provided empirical support for H3 (β=0.281, T-Stat=4.128, p<0.001). H4 was also accepted based on empirical support provided by the results (β=0.263, T-Stat=3.731, p<0.001). In H4, we proposed a positive and significant relationship between perceived usefulness and attitude. H5 is also robustly accepted on empirical grounds provided by the results (β=0.145, T-Stat=2.140, p<0.05). In H5, we proposed a significant positive relationship between attitude and intention to play AI-powered avatar. In H6, we observed a positive relationship between perceived enjoyment and consumer intention to play AI-powered avatar; results provided support for H6 (β=0.417, T-Stat=6.265, p<0.001). H7 was also supported by results (β=0.174, T-Stat=3.181, p<0.001). In H7, we proposed a positive and significant relationship between customization and intention to play AI-powered avatar. In H8, we proposed a positive impact of perceived interactivity on the intention to play AI-powered avatar, and the results provide support for this hypothesis (β=0.157, T-Stat=3.544, p<0.001). Figure-2 provides the structural model results.

Table-2: Hypotheses testing

Hypothesis	β Coefficient	SD	T-Statistics	P Values	Decision
H1a: Perceived relative advantage → Perceived ease of use	0.298	0.060	4.986	0.000	Supported
H1b: Perceived relative advantage → Perceived Usefulness	0.243	0.064	3.784	0.000	Supported
H2a: Compatibility → Perceived usefulness	0.407	0.054	7.550	0.000	Supported
H2b: Compatibility → Perceived usefulness	0.376	0.064	5.865	0.000	Supported
H3: Perceived ease of use → Attitude	0.281	0.068	4.128	0.000	Supported
H4: Perceived usefulness → Attitude	0.263	0.071	3.731	0.000	Supported
H5: Attitude -> Gamer Intention to play AI-powered avatar	0.145	0.068	2.140	0.032	Supported
H6: Perceived enjoyment → Gamer Intention to play AI-powered avatar	0.417	0.066	6.265	0.000	Supported
H7: Customization → Gamer Intention to play AI-powered avatar	0.174	0.055	3.181	0.001	Supported
H8: Perceived interactivity → Gamer Intention to play AI-powered avatar	0.157	0.044	3.544	0.000	Supported



Note: *ATT (Attitude), COMP (Compatibility), CUST (Customization), GINT (Gamer Intention to play AI-powered avatar), PENJ (Perceived enjoyment), PEU (Perceived ease of use), PINT (Perceived interactivity), PRA (Perceived relative advantage), PU (Perceived usefulness), and VIF (Variance Inflation Factor).*

Figure-2 Structural Model

4.3.2 Coefficient of Determination (R^2)

The coefficient of determination or R^2 is used to evaluate the model's predictive accuracy and to assess the overall effect size or variance caused by exogenous variables. The R^2 value for consumer attitude toward AI-powered avatar is 0.247, which indicates a 24.7% variance in attitude caused by perceived usefulness and perceived ease of use. The R^2 value for intention to play AI-powered avatar is 0.499, which indicates a 49.9% variance caused by consumer attitude toward AI-powered avatar. The R^2 value for perceived usefulness is 0.267, which indicates that a 26.7% variance in perceived usefulness is caused by perceived relative advantage and compatibility. A total of 34.5% variance in perceived ease of use is caused by perceived relative advantage and compatibility.

4.3.3 Predictive Relevance (Q^2)

While using R^2 as a measure of the model's predictive accuracy, Q^2 must also be evaluated to assess predictive relevance (Geisser, 1974; Stone, 1974). Stone Geisser's predictive relevance test, called Q^2, is a measure of out of sample predictive relevance or predictive power. The PLS-SEM calculates the Q^2 automatically by the blindfolding procedure. The threshold values of Q^2 are 0.02 as small, 0.15 as a medium, and 0.35 as large. Q2 value for attitude is 0.145, for Gamer Intention to play AI-powered avatar is 0.365, for perceived ease of use Q2 value is 0.221 and for perceived usefulness the Q2 value is 0.181. These values indicate a good predictive relevance.

4.3.4 Effect Size (f^2)

The change in R^2 can measure the effect of a particular independent variable on the dependent variable by omitting the independent variables from the model one-by-one and then checking whether any difference occurs in the R^2 value. This measure is known as effect size and is denoted by f^2. The threshold values of f^2 are 0.02 as small, 0.15 as a medium, and 0.35 as large effect sizes (Cohen, 2013) (see Table-E in the appendix).

4.3.5 PLS-SEM Model Fit

This study's data has been analyzed using SmartPLS software. Therefore, while the running algorithm, this software will return important values of model fit along with other measures. These important values are Standardized Root Mean Square Residual (SRMR) and Normed Fit Index (NFI). Acceptable value SRMR is less than 0.1, which is to be considered a good fit as suggested by Henseler et al. (2014), and Hu, Bentler, and Hu (1998). Normed fit index (NFI) is calculated by subtracting 1 from the Chi^2 of the observed model and then dividing by Chi^2 of the null model. This equation returns a value between zero and one, the model fit is better when the value is closer to 1 (Lohmöller, 1990). The SRMR value of this study is 0.05 and the NFI value is 0.805, which indicates a good model fit.

5. Discussion and Implications

This study demonstrates positive outcomes from the perspective of an AI-powered avatar. The results predict that the perceived relative advantage and computability positively affected the PEU and PU of AI-powered avatars, which are in line with previous studies (Min, So, & Jeong, 2019). Furthermore, the results provided the relationship of consumers' attitude with its usage and usefulness. AI-powered avatars are considered to be easy to use and useful, which is highlighted with positive results towards the gamer's attitude. These relationship results are in line with the previous studies (Suki & Suki, 2011; Wang et al., 2020). In this scenario, consumer attitudes towards AI-powered avatars were positive and in conjunction with previous studies, where attitude positively affected the consumers' behavioral intention (Al-Rahmi et al., 2019).

The gamers perceived that avatar customization through AI is a fantastic tool, which will help in the interaction with the avatar. The results also supported the two constructs of customization and interactivity in this conceptual framework, which have proven to influence the end user to use innovative technology (Pillai et al., 2020). Finally, gaming is an immersive and exciting experience, and the users play games to have a pleasurable experience. The enjoyment factor, an AI context-specific variable in the current study, provided a positive influence on the adoption of an AI-powered avatar. The previous studies have also highlighted the importance of enjoyment as a strong predictor of technology adoption (Ho et al., 2017; Jang & Park, 2019). Hence, an AI-powered avatar will provide a pleasurable experience, interactive gameplay, and customization functions to the gamers' during the gameplay.

5.1 Theoretical Implications

This study has demonstrated several theoretical contributions to the body of knowledge, as follows. The first study investigates the AI-powered avatar concept adoption by gamers by integrating innovation diffusion theory, technology acceptance model, and AI context-specific variables. The findings reveal that the relative advantage and compatibility influence the end user towards its easiness and usefulness, which is in alignment with previous studies (J. S. Black & van Esch, 2020; van Esch & Black, 2019). The perceived ease of use and perceived usefulness of an AI-powered avatar influences the gamers to adopt this technology for the gameplay. This study also adds value to the theories of innovation diffusion theory and TAM.

Furthermore, this study highlights AI-powered avatar adoption with AI context-specific variables. AI technologies have been discussed and explained in the context of the gamer's emotional and psychological behavior (Lewis & Dill, 2015). It represents the psychological processing of the adoption of AI-powered avatar through this framework, and the results of this study support the constructs. The AI context-specific variables help in the development of AI theory from the perspective of gaming. However, research is an on-going process and AI theory development is still underway. Therefore, this study will help the development of the new concept of an AI-powered avatar. Hence, an AI-powered avatar in the gaming environment may be a game-changer in the future. This research further adds value to the literature on gaming and AI technologies. Finally, this paper tries to fill the gap of how to integrate emerging technologies in the gaming environment for a more interactive experience, focusing on the gamer's adoption of an AI-powered avatar.

5.2 Implications for Practice

The research findings of this study should provide actionable strategies for managers of game developers. This study demonstrates that an AI-powered avatar influences the gamer's intention to adopt it. Hence, the AI-powered avatar concept will enhance the gamer's performance and pleasurable experience. Therefore, managers should focus on adopting AI technologies to integrate them with the avatar. The previous literature has shown positive results where a gamer believes that they and the avatar are one personality (Jin, 2010; Teng, 2017).

Game developers should develop AI-powered avatars to provide an interactive experience with customization abilities during the gameplay. This AI-powered avatar concept will help the gamers to interact in two-way communication with their avatar to improve performance. In particular, gamers tend to buy in-game features to advance to the next level more quickly (Hamari et al., 2017). Hence, an AI-powered avatar can be integrated as an in-game feature for those who wish to spend money to make their avatar more attractive and powerful. In addition to the avatar's regular features, AI-powered avatars can make the gamers feel that the game is more immersive and this improves their enjoyment of the experience. An AI-powered avatar feature in the game can make the gamers to think, act, react, and interact with their avatar.

An AI-powered avatar would offer gamers the ability to move swiftly, make a strategic plan during the gameplay, and customize the avatar and the information according to their needs. Consequently, game developers could add AI-powered avatar features to give gamers a wonderful experience and to earn revenues through its interaction mode. Youngsters tend to adopt in-game features more quickly related to their avatars (Mancini, Imperato, & Sibilla, 2019). Hence, game developers may target young users and attract them by using AI-powered avatar features. Gaming is a virtual world on its own, and gamers need to have more interaction with gaming communities and their avatar (King & Potenza, 2019; Sitterding, Raab, Saupe, & Israel, 2019). Therefore, the managers of game developers can develop AI-powered avatars to provide interactive communication to the gamers in the virtual world. According to the findings of this study, AI context-specific variables can encourage gamers to adopt an AI-powered avatar.

5.3 Limitations and Future Research Directions

The findings of this study are based on 500 responses from one city in China. Therefore, the results should not be generalized. For future reference, the sample size should be increased to improve our understanding of AI-powered avatars. Furthermore, big data techniques may be used to analyze more extensive data. Therefore, new methods should be used for the collection of data from millions of online gamers. This approach may significantly improve our understanding of the AI-powered avatar concept. This research study was a cross-sectional study, therefore experimental research can be done in the future to elaborate on the consumer attitudes towards AI-powered avatar adoption. However, a cross-sectional study is adequate for the external validity of the findings.

Experimental studies can be adopted to develop game design platforms integrated with AI tools to understand the causality of this study's construct. In addition, the TRAM model of TRI and TAM may be used for innovative consumers. This research has explained the concept of an AI-powered avatar from the results of one country. For future work, a comparative analysis between two countries with many online gamers may help us to understand this concept in more depth. This study has investigated the AI tools s to understand avatar adoption. For future work, the AI tools may be integrated with other technologies such as AR/VR to better understand the gamers' attitudes towards AI-powered avatar usage.

6 Conclusion

In the recent years, AI technologies have significantly revolutionized the gaming environment. Thus, an AI-powered avatar may be beneficial for gamers during the gameplay. All of the relationships proposed in the conceptual framework were significantly supported with the empirical data. An AI-powered avatar with AI context-specific tools can enhance the gamers' experience and assist them in the gaming environment. The interactive experience, customization ability, and enjoyment features of an AI-powered avatar can revolutionize the gaming experience. Gamers can achieve their desired goals through its use, and game developers can increase sales and revenues by developing AI features in the game.

References

Al-Rahmi, W. M., Yahaya, N., Alamri, M. M., Alyoussef, I. Y., Al-Rahmi, A. M., & Kamin, Y. B. (2019). Integrating innovation diffusion theory with technology acceptance model: Supporting students' attitude towards using a massive open online courses (MOOCs) systems. *Interactive Learning Environments*, 1-13.

Araujo, T. (2018). Living up to the chatbot hype: The influence of anthropomorphic design cues and communicative agency framing on conversational agent and company perceptions. *Computers in Human behavior, 85*, 183-189.

Bakpayev, M., Baek, T. H., van Esch, P., & Yoon, S. (2020). Programmatic creative: AI can think but it cannot feel. *Australasian Marketing Journal (AMJ)*.

Black, D. (2017). Why can I see my avatar? Embodied visual engagement in the third-person video game. *Games and culture, 12*(2), 179-199.

Black, J. S., & van Esch, P. (2020). AI-enabled recruiting: What is it and how should a manager use it? *Business Horizons, 63*(2), 215-226.

Butcher, L., Sung, B., & Raynes-Goldie, K. (2019). Gotta catch 'em all: invigorating Pokémon through an innovative brand extension. *Journal of brand management, 26*(3), 227-239.

Butcher, L., Tucker, O., & Young, J. (2020). Path to discontinuance of pervasive mobile games: the case of Pokémon Go in Australia. *Asia Pacific Journal of Marketing and Logistics*.

Buunk, A. P., & Dijkstra, P. (2011). Does attractiveness sell? Women's attitude toward a product as a function of model attractiveness, gender priming, and social comparison orientation. *Psychology & Marketing, 28*(9), 958-973.

Chang, I.-C., Liu, C.-C., & Chen, K. (2014). The effects of hedonic/utilitarian expectations and social influence on continuance intention to play online games. *Internet Research*.

Chin, W. W. (1998). Commentary: Issues and opinion on structural equation modeling. In: JSTOR.
Chin, W. W. (1998). The partial least squares approach to structural equation modeling. *Modern methods for business research, 295*(2), 295-336.
Chou, C. Y., & Sawang, S. (2015). Virtual community, purchasing behaviour, and emotional well-being. *Australasian Marketing Journal (AMJ), 23*(3), 207-217.
Chou, H. Y., Chu, X. Y., & Chiang, Y. H. (2020). What should we call this color? The influence of color-naming on consumers' attitude toward the product. *Psychology & Marketing*.
Chung, M., Ko, E., Joung, H., & Kim, S. J. (2018). Chatbot e-service and customer satisfaction regarding luxury brands. *Journal of Business Research*.
Cohen, J. (2013). *Statistical power analysis for the behavioral sciences*: Routledge.
Crittenden, V. L., Crittenden, W. F., & Ajjan, H. (2020). Women in sales in developing countries: The value of technology for social impact. *Business Horizons*.
Danckwerts, S., & Kenning, P. (2019). "It's MY Service, it's MY Music": The role of psychological ownership in music streaming consumption. *Psychology & Marketing, 36*(9), 803-816.
Douglas, M. A., Overstreet, R. E., & Hazen, B. T. (2016). Art of the possible or fool's errand? Diffusion of large-scale management innovation. *Business Horizons, 59*(4), 379-389.
Duan, Y., Edwards, J. S., & Dwivedi, Y. K. (2019). Artificial intelligence for decision making in the era of Big Data–evolution, challenges and research agenda. *International Journal of Information Management, 48*, 63-71.
Dwivedi, Y. K., Hughes, L., Ismagilova, E., Aarts, G., Coombs, C., Crick, T., . . . Eirug, A. (2019). Artificial Intelligence (AI): Multidisciplinary perspectives on emerging challenges, opportunities, and agenda for research, practice and policy. *International Journal of Information Management*, 101994.
Engelman, R. M., Fracasso, E. M., Schmidt, S., & Zen, A. C. (2017). Intellectual capital, absorptive capacity and product innovation. *Management Decision*.
Fiore, A. M., Jin, H. J., & Kim, J. (2005). For fun and profit: Hedonic value from image interactivity and responses toward an online store. *Psychology & Marketing, 22*(8), 669-694.
Fornell, C., & Bookstein, F. L. (1982). Two structural equation models: LISREL and PLS applied to consumer exit-voice theory. *Journal of Marketing research, 19*(4), 440-452.
Fujita, H., & Wu, I. (2012). A special issue on artificial intelligence in computer games: AICG. In.
Geisser, S. (1974). A predictive approach to the random effect model. *Biometrika, 61*(1), 101-107.
Ghazali, E., Mutum, D. S., & Woon, M.-Y. (2019). Exploring player behavior and motivations to continue playing Pokémon GO. *Information Technology & People*.
Hair, J. F., Ringle, C. M., & Sarstedt, M. (2011). PLS-SEM: Indeed a silver bullet. *Journal of Marketing theory and Practice, 19*(2), 139-152.
Hair, J. F., Sarstedt, M., Ringle, C. M., & Mena, J. A. (2012). An assessment of the use of partial least squares structural equation modeling in marketing research. *Journal of the academy of marketing science, 40*(3), 414-433.
Hair Jr, J. F., Sarstedt, M., Ringle, C. M., & Gudergan, S. P. (2017). *Advanced issues in partial least squares structural equation modeling*: Sage Publications.
Hamari, J., Alha, K., Järvelä, S., Kivikangas, J. M., Koivisto, J., & Paavilainen, J. (2017). Why do players buy in-game content? An empirical study on concrete purchase motivations. *Computers in Human behavior, 68*, 538-546.
Hang, H., & Auty, S. (2011). Children playing branded video games: The impact of interactivity on product placement effectiveness. *Journal of consumer psychology, 21*(1), 65-72.
Henseler, J., Dijkstra, T. K., Sarstedt, M., Ringle, C. M., Diamantopoulos, A., Straub, D., . . . Calantone, R. J. (2014). Common Beliefs and Reality About Partial Least Squares: Comments on Rönkkö & Evermann (2013). *Social Science Electronic Publishing, 17*(2), 182-209.
Henseler, J., Hubona, G., & Ray, P. A. (2016). Using PLS path modeling in new technology research: updated guidelines. *Industrial management data systems, 116*(1), 2-20.
Henseler, J., & Sarstedt, M. (2013). Goodness-of-fit indices for partial least squares path modeling. *Computational Statistics, 28*(2), 565-580.
Herbrich, R., Minka, T., & Graepel, T. (2007). *TrueSkill™: a Bayesian skill rating system.* Paper presented at the Advances in neural information processing systems.

Herrmann, A., Hildebrand, C., Sprott, D. E., & Spangenberg, E. R. (2013). Option framing and product feature recommendations: product configuration and choice. *Psychology & Marketing, 30*(12), 1053-1061.
Hill, J., Ford, W. R., & Farreras, I. G. (2015). Real conversations with artificial intelligence: A comparison between human–human online conversations and human–chatbot conversations. *Computers in Human behavior, 49*, 245-250.
Ho, S. S., Lwin, M. O., Sng, J. R., & Yee, A. Z. (2017). Escaping through exergames: Presence, enjoyment, and mood experience in predicting children's attitude toward exergames. *Computers in Human behavior, 72*, 381-389.
Hopp, T., & Fisher, J. (2017). Examination of the relationship between gender, performance, and enjoyment of a first-person shooter game. *Simulation & Gaming, 48*(3), 338-362.
Howard, A., & Borenstein, J. (2020). AI, robots, and ethics in the age of COVID-19. *MIT Sloan Management Review, 12*.
Hu, L., Bentler, P., & Hu, L. (1998). Fit indices in covariance structure modelling: sensitivityto underparameterization model misspecification. *Psychological Methods, 3*(4), 424-453.
Hwang, A. H. C., Oh, J., & Scheinbaum, A. C. (2020). Interactive music for multisensory e-commerce: The moderating role of online consumer involvement in experiential value, cognitive value, and purchase intention. *Psychology & Marketing*.
Jang, Y., & Park, E. (2019). An adoption model for virtual reality games: The roles of presence and enjoyment. *Telematics and Informatics, 42*, 101239.
Jin, S.-A. A. (2010). "I Feel More Connected to the Physically Ideal Mini Me than the Mirror-Image Mini Me": Theoretical Implications of the "Malleable Self" for Speculations on the Effects of Avatar Creation on Avatar–Self Connection in Wii. *Cyberpsychology, Behavior, and Social Networking, 13*(5), 567-570.
Kannan, P., & Bernoff, J. (2019). The future of customer service is AI-Human collaboration. *MIT Sloan Management Review*.
Kaplan, A., & Haenlein, M. (2019). Siri, Siri, in my hand: Who's the fairest in the land? On the interpretations, illustrations, and implications of artificial intelligence. *Business Horizons, 62*(1), 15-25.
Kim, S., Chen, R. P., & Zhang, K. (2016). Anthropomorphized helpers undermine autonomy and enjoyment in computer games. *Journal of consumer research, 43*(2), 282-302.
Kim, Y., & Sundar, S. S. (2012). Visualizing ideal self vs. actual self through avatars: Impact on preventive health outcomes. *Computers in Human behavior, 28*(4), 1356-1364.
King, D. L., & Delfabbro, P. H. (2019). Video game monetization (eg,'loot boxes'): A blueprint for practical social responsibility measures. *International Journal of Mental Health and Addiction, 17*(1), 166-179.
King, D. L., & Potenza, M. N. (2019). Not playing around: gaming disorder in the International Classification of Diseases (ICD-11). *Journal of Adolescent Health, 64*(1), 5-7.
Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. *International Journal of e-Collaboration (ijec), 11*(4), 1-10.
Kumar, V., Rajan, B., Venkatesan, R., & Lecinski, J. (2019). Understanding the role of artificial intelligence in personalized engagement marketing. *California management review, 61*(4), 135-155.
Lewis, M., & Dill, K. (2015). Game AI appreciation, revisited. *Game AI Pro, 2*, 3-17.
Li, R., Chung, T.-L. D., & Fiore, A. M. (2017). Factors affecting current users' attitude towards e-auctions in China: An extended TAM study. *Journal of retailing and consumer services, 34*, 19-29.
Liao, G.-Y., Cheng, T., & Teng, C.-I. (2019). How do avatar attractiveness and customization impact online gamers' flow and loyalty? *Internet Research*.
Lin, C. H., Shih, H. Y., & Sher, P. J. (2007). Integrating technology readiness into technology acceptance: The TRAM model. *Psychology & Marketing, 24*(7), 641-657.
Lohmöller, D. J.-B. (1990). *Latent variable path modeling with partial least squares*: Physica-Verlag HD.
Lwin, M. O., & Malik, S. (2012). The efficacy of exergames-incorporated physical education lessons in influencing drivers of physical activity: a comparison of children and pre-adolescents. *Psychology of Sport and Exercise, 13*(6), 756-760.

Mancini, T., Imperato, C., & Sibilla, F. (2019). Does avatar's character and emotional bond expose to gaming addiction? Two studies on virtual self-discrepancy, avatar identification and gaming addiction in massively multiplayer online role-playing game players. *Computers in Human behavior, 92*, 297-305.

Mazurek, G., & Małagocka, K. (2019). What if you ask and they say yes? Consumers' willingness to disclose personal data is stronger than you think. *Business Horizons, 62*(6), 751-759.

McGloin, R., Farrar, K. M., Krcmar, M., Park, S., & Fishlock, J. (2016). Modeling outcomes of violent video game play: Applying mental models and model matching to explain the relationship between user differences, game characteristics, enjoyment, and aggressive intentions. *Computers in Human behavior, 62*, 442-451.

Min, S., So, K. K. F., & Jeong, M. (2019). Consumer adoption of the Uber mobile application: Insights from diffusion of innovation theory and technology acceptance model. *Journal of Travel & Tourism Marketing, 36*(7), 770-783.

Nielsen, C., & Lund, M. (2019). Small data: data strategies that most companies can profit from. *California management review, 62*(1).

Nilsson, N. J. (2009). *The quest for artificial intelligence*: Cambridge University Press.

Nunnally, J. C., & Bernstein, I. (1994). Validity. *Psychometric theory*, 99-132.

Oosthuizen, K., Botha, E., Robertson, J., & Montecchi, M. (2020). Artificial intelligence in retail: The AI-enabled value chain. *Australasian Marketing Journal (AMJ)*.

Pantano, E., & Pizzi, G. (2020). Forecasting artificial intelligence on online customer assistance: Evidence from chatbot patents analysis. *Journal of retailing and consumer services, 55*, 102096.

Park, B.-W., & Lee, K. C. (2011). Exploring the value of purchasing online game items. *Computers in Human behavior, 27*(6), 2178-2185.

Patel, V., Das, K., Chatterjee, R., & Shukla, Y. (2020). Does the interface quality of mobile shopping apps affect purchase intention? An empirical study. *Australasian Marketing Journal (AMJ), 28*(4), 300-309.

Peña, J., & Kim, E. (2014). Increasing exergame physical activity through self and opponent avatar appearance. *Computers in Human behavior, 41*, 262-267.

Pillai, R., Sivathanu, B., & Dwivedi, Y. K. (2020). Shopping intention at AI-powered automated retail stores (AIPARS). *Journal of retailing and consumer services, 57*, 102207.

Przegalinska, A., Ciechanowski, L., Stroz, A., Gloor, P., & Mazurek, G. (2019). In bot we trust: A new methodology of chatbot performance measures. *Business Horizons, 62*(6), 785-797.

Rabin, S. (2013). *Game AI pro: collected wisdom of game AI professionals*: CRC Press.

Rahman, M. M., Lesch, M. F., Horrey, W. J., & Strawderman, L. (2017). Assessing the utility of TAM, TPB, and UTAUT for advanced driver assistance systems. *Accident Analysis & Prevention, 108*, 361-373.

Ransbotham, S., Gerbert, P., Reeves, M., Kiron, D., & Spira, M. (2018). Artificial intelligence in business gets real. *MIT Sloan Management Review and Boston Consulting Group*.

Rogers, E. M. (2010). *Diffusion of innovations*: Simon and Schuster.

Schwarz, A., Rizzuto, T., Carraher-Wolverton, C., Roldán, J. L., & Barrera-Barrera, R. (2017). Examining the impact and detection of the urban legend of common method bias. *ACM SIGMIS Database: the DATABASE for Advances in Information Systems, 48*(1), 93-119.

Sitterding, M. C., Raab, D. L., Saupe, J. L., & Israel, K. J. (2019). Using Artificial Intelligence and Gaming to Improve New Nurse Transition. *Nurse Leader, 17*(2), 125-130.

Song, J., Drennan, J. C., & Andrews, L. M. (2012). Exploring regional differences in Chinese consumer acceptance of new mobile technology: A qualitative study. *Australasian Marketing Journal (AMJ), 20*(1), 80-88.

Sparks, J. V., & Chung, S. (2016). The effects of psychobiological motivational traits on memory of in-game advertising messages. *Psychology & Marketing, 33*(1), 60-68.

Stern, B. B., Royne, M. B., Stafford, T. F., & Bienstock, C. C. (2008). Consumer acceptance of online auctions: An extension and revision of the TAM. *Psychology & Marketing, 25*(7), 619-636.

Stone, M. (1974). Cross-validatory choice and assessment of statistical predictions. *Journal of the Royal Statistical Society: Series B (Methodological), 36*(2), 111-133.

Su, H. J., Comer, L. B., & Lee, S. (2008). The effect of expertise on consumers' satisfaction with the use of interactive recommendation agents. *Psychology & Marketing, 25*(9), 859-880.

Suki, N. M., & Suki, N. M. (2011). Exploring the relationship between perceived usefulness, perceived ease of use, perceived enjoyment, attitude and subscribers' intention towards using 3G mobile services. *Journal of Information Technology Management, 22*(1), 1-7.

Talwar, S., Talwar, M., Kaur, P., & Dhir, A. (2020). Consumers' resistance to digital innovations: A systematic review and framework development. *Australasian Marketing Journal (AMJ), 28*(4), 286-299.

Tarafdar, M., Beath, C. M., & Ross, J. W. (2019). Using AI to enhance business operations. *MIT Sloan Management Review, 11*.

Tenenhaus, M., Vinzi, V. E., Chatelin, Y.-M., & Lauro, C. (2005). PLS path modeling. *Computational statistics data analysis, 48*(1), 159-205.

Teng, C.-I. (2017). Impact of avatar identification on online gamer loyalty: Perspectives of social identity and social capital theories. *International Journal of Information Management, 37*(6), 601-610.

Trepte, S., & Reinecke, L. (2010). Avatar creation and video game enjoyment. *Journal of Media Psychology*.

Tung, F.-C., Lee, M. S., Chen, C.-C., & Hsu, Y.-S. (2009). An extension of financial cost and TAM model with IDT for exploring users' behavioral intentions to use the CRM information system. *Social Behavior and Personality: an international journal, 37*(5), 621-626.

Vahdat, A., Alizadeh, A., Quach, S., & Hamelin, N. (2020). Would you like to shop via mobile app technology? The technology acceptance model, social factors and purchase intention. *Australasian Marketing Journal (AMJ)*.

van Esch, P., & Black, J. S. (2019). Factors that influence new generation candidates to engage with and complete digital, AI-enabled recruiting. *Business Horizons, 62*(6), 729-739.

Van Kerrebroeck, H., Brengman, M., & Willems, K. (2017). When brands come to life: experimental research on the vividness effect of Virtual Reality in transformational marketing communications. *Virtual Reality, 21*(4), 177-191.

Wang, H., Ruan, Y.-C., Hsu, S.-Y., & Sun, C.-T. (2019). *Effects of Game Design Features on Player-Avatar Relationships and Motivation for Buying Decorative Virtual Items.* Paper presented at the DiGRA Conference.

Wang, X., Butt, A. H., Zhang, Q., Shafique, M. N., Ahmad, H., & Nawaz, Z. (2020). Gaming Avatar Can Influence Sustainable Healthy Lifestyle: Be like an Avatar. *Sustainability, 12*(5), 1998.

Werder, K., Seidel, S., Recker, J., Berente, N., Gibbs, J., Abboud, N., & Benzeghadi, Y. (2020). Data-Driven, Data-Informed, Data-Augmented: How Ubisoft's Ghost Recon Wildlands Live Unit Uses Data for Continuous Product Innovation. *California management review, 62*(3), 86-102.

Westera, W., Prada, R., Mascarenhas, S., Santos, P. A., Dias, J., Guimarães, M., . . . Yumak, Z. (2020). Artificial intelligence moving serious gaming: Presenting reusable game AI components. *Education and Information Technologies, 25*(1), 351-380.

Wottrich, V. M., Verlegh, P. W., & Smit, E. G. (2017). The role of customization, brand trust, and privacy concerns in advergaming. *International Journal of Advertising, 36*(1), 60-81.

Xu, Y., Shieh, C.-H., van Esch, P., & Ling, I.-L. (2020). AI customer service: Task complexity, problem-solving ability, and usage intention. *Australasian Marketing Journal (AMJ)*.

Yannakakis, G. N., & Togelius, J. (2018). *Artificial intelligence and games* (Vol. 2): Springer.

Yee, N. (2006). Motivations for play in online games. *CyberPsychology & Behavior, 9*(6), 772-775.

Zafar, A. U., Qiu, J., Li, Y., Wang, J., & Shahzad, M. (2019). The impact of social media celebrities' posts and contextual interactions on impulse buying in social commerce. *Computers in Human Behavior*, 106178.

Zhang, J., & Mao, E. (2020). Cash, credit, or phone? An empirical study on the adoption of mobile payments in the United States. *Psychology & Marketing, 37*(1), 87-98.

Web Appendix
Let's play: Me and my AI-powered avatar as one team

Table-A: Demographic profile of the respondents

Characteristics	Distribution	Frequency	Percentage
Gender	Male	371	74.2
	Female	129	25.8
Age	15-20	77.0	15.4
	21-25	399	79.8
	26-30	20.0	4.00
	31-35	4.00	0.80
Education	Undergraduate Degree	433	86.6
	Master's degree	60.0	12.0
	Ph.D. Degree	7.00	1.40
Occupation	Student	462	92.4
	Job	34.0	6.80
	Business	4.00	0.80
Playing days per week	1-2 Days	154	30.8
	2-3 Days	122	24.4
	4-6 Days	100	20.0
	Everyday	124	24.8
Amount of time per day	1-2 Hours	277	55.4
	3-4 Hours	141	28.2
	> 5 Hours	82.0	16.4

Table-B: Inner VIF (Common Method Bias)

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Attitude toward AI-powered avatar		1.57	1.64	1.66	1.68	1.67	1.61	1.62	1.65
(2) Compatibility	1.62		1.55	1.63	1.65	1.66	1.58	1.62	1.66
(3) Customization	1.66	1.61		1.67	1.69	1.64	1.64	1.69	1.68
(4) Gamer Intention to play AI-powered avatar	2.10	2.06	2.10		1.92	2.11	2.06	2.03	2.09
(5) Perceived enjoyment	2.28	2.28	2.32	2.08		2.10	2.28	2.22	2.29
(6) Perceived ease of use	2.44	2.45	2.37	2.44	2.25		2.45	2.43	1.94
(7) Perceived interactivity	1.56	1.59	1.57	1.58	1.61	1.62		1.60	1.61
(8) Perceived relative advantage	1.63	1.64	1.66	1.60	1.60	1.65	1.64		1.66
(9) Perceived usefulness	2.13	2.16	2.15	2.12	2.15	1.71	2.15	2.15	

Table-C: Fornell-Larcker Criterion (Discriminant Validity)

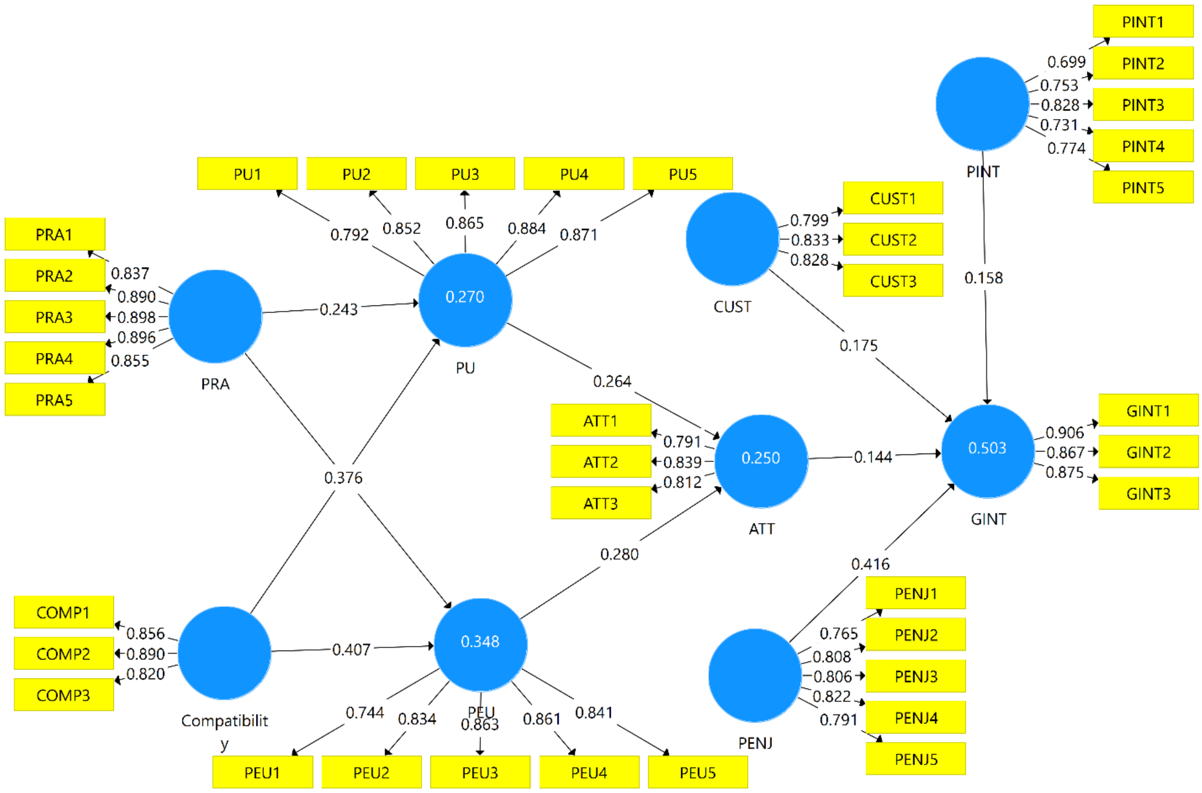
Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Attitude toward AI-powered avatar	0.814								
(2) Compatibility	0.471	0.820							
(3) Customization	0.444	0.494	0.856						
(4) Gamer Intention to play AI-powered avatar	0.503	0.501	0.462	0.883					
(5) Perceived enjoyment	0.486	0.447	0.461	0.636	0.799				
(6) Perceived ease of use	0.462	0.439	0.522	0.493	0.631	0.830			
(7) Perceived interactivity	0.470	0.460	0.462	0.494	0.450	0.426	0.758		
(8) Perceived relative advantage	0.455	0.433	0.385	0.535	0.538	0.454	0.409	0.876	
(9) Perceived usefulness	0.457	0.432	0.469	0.517	0.559	0.690	0.431	0.387	0.853

Table-D: HTMT-Ratio (Discriminant Validity)

Constructs	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
(1) Attitude toward AI-powered avatar									
(2) Compatibility	0.594								
(3) Customization	0.554	0.608							
(4) Gamer Intention to play AI-powered avatar	0.609	0.584	0.549						
(5) Perceived enjoyment	0.582	0.525	0.540	0.735					
(6) Perceived ease of use	0.545	0.508	0.600	0.565	0.722				
(7) Perceived interactivity	0.591	0.574	0.568	0.588	0.541	0.502			
(8) Perceived relative advantage	0.536	0.495	0.437	0.599	0.601	0.500	0.473		
(9) Perceived usefulness	0.540	0.493	0.540	0.587	0.631	0.770	0.503	0.420	

Table-E: Effect Size f^2

Constructs	Attitude	Gamer Intention to play AI powered avatar	Perceived ease of use	Perceived interactivity	Perceived usefulness
(1) Attitude toward AI-powered avatar		0.027			
(2) Compatibility		0.041			
(3) Customization			0.217		0.165
(4) Perceived enjoyment		0.233			
(5) Perceived ease of use	0.055				
(6) Perceived interactivity		0.034			
(7) Perceived relative advantage			0.116		0.069
(8) Perceived usefulness	0.049				



Note: *ATT (Attitude toward AI-powered avatar), COMP (Compatibility), CUST (Customization), GINT (Gamer Intention to play AI-powered avatar), PENJ (Perceived enjoyment), PEU (Perceived ease of use), PINT (Perceived interactivity), PRA (Perceived relative advantage), and PU (Perceived usefulness).*

Figure-A Measurement Model