

# A study of player behavior and motivation to purchase Dota 2 virtual in game items

Motivation to purchase in-game items

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## Abstract

**Purpose** – The goal of this study is to examine the factors (e.g. enjoyment, skills, challenge, telepresence and flow) that influence players' purchase intention toward Dota 2 virtual in-game as well as examine the effect of flow toward purchase intention of Dota 2 through the critical mechanism (i.e. continuous intention). Notably, the analysis of the moderating role of enjoyment of buying on the relation of (a) flow and purchase intention of Dota 2 in-game, as well as (b) between flow continuous intention and finally (c) between continuous intention purchase intention of Dota 2.

**Design/methodology/approach** – The data were gained from 331 users using Google Forms and posted to respondents on social media platforms and forums such as Facebook and Reddit, as these websites have the closest reach to gamers.

**Findings** – The study revealed that enjoyment, skill, challenge and telepresence have a positive effect on flow. Also, the flow was significantly related to purchase intention. The continuous intention has significantly mediated the relationship between flow and purchase intention. Importantly, this study found that the moderating role of buying enjoyment increases the relationship between flow and purchase intention (H7a) and between continuous intention and purchase intention (H7c). In contrast, the moderating role of buying enjoyment on the relationship between flow and continuous intention (H7b) was not supported. Hence, this study sheds a new light on the notable Dota 2 in-game and continuous intention purchase intention of the users.

**Originality/value** – In response, this study's main research question can be highlighted on testing how enjoyment, skills, challenge, telepresence, in-game virtual items influence purchasing intention when the enjoyment of buying moderates the proposed relationship? Therefore, this study aims to examine the

*Ethical approval:* All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

*Informed consent:* Informed consent was obtained from all individual participants included in the study.

*Conflict of interest:* All authors declare that they have no conflict of interest.

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significant elements like enjoyment, skills, challenge telepresence toward flow, and subsequently, the effect of flow toward purchase intention of Dota 2 in-game through continuous intention as a key mechanism which is urgently needed to minimize the gap in-game virtual items literature. Significantly, this study also intends to explore the contingent role of enjoyment of buying on the relation of flow and purchase intention of Dota-2 in-game, as well as between flow and continuous intention and finally between continuous intention and purchase intention.

**Keywords** Dota 2 in-game, Enjoyment, Skill, Challenge, Telepresence, Flow, Continuous intention, Purchase intention

**Paper type** Research paper

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## 1. Introduction

Esports have become widely popular nowadays. There are even suggestions that electronic sports, or widely known as eSports, will one day surpass even the most famous regular sports, soccer/football and basketball (Pielke, 2016; Olgun *et al.*, 2016; Raoufinia *et al.*, 2019; Uzir *et al.*, 2020). Esports growth has become phenomenal that games are developing into lucrative businesses to game developers and companies (Crandall and Sidak, 2006; Marchand and Hennig-Thurau, 2013; Lehtonen *et al.*, 2020). According to Statista (2020b), there is an expected 50.87% growth for eSports' revenue from 1.06 billion US dollars to 1.59 billion US dollars within four years from 2020 to 2023. From an event and business perspective, eSports possesses massive potential for growth. As for Dota 2, similar growth is also identified as the game's revenue generated increased from 238 million US dollars in 2015 to 406 million US dollars in 2017, equivalent to 70.59% in revenue growth (Statista, 2020a). The International back in 2011 was the tournament that had a giant prize pool in eSports tournament's history and was the game developed by valve's aiming to nurture into the biggest game in the world.

Nevertheless, in 2020, Dota 2 holds the top 5 highest prize pools in eSports tournaments' history for the past five international editions (Esports Earnings, 2020). International 1 and 2 had prize pools fixed at 1.6 million US dollars. Therefore, Dota 2 players who purchased compendium would be awarded different perks exclusive for compendium owners, with 25% of the compendium price going into the tournament prize pool. As the compendium was a success in its debut year, valve continued to add perks into the subsequent compendium in future international tournaments. The current tenth edition of The International presently has 10 million US dollars in the prize pool and is growing daily (Esports Earnings, 2020).

With the compendium introduction, valve continued introducing in-game virtual items for Dota 2, namely cosmetics, to enhance Dota 2 in-game characters and soundtracks (Thavamuni *et al.*, 2019). It has been a staple for Dota 2 ever since, making it one of the valve's most giant cash cows. Virtual in-game items refer to intangible products, which are made available in games to enhance the appearance of a gamer's online persona or increase the power statistics of a gamer's online persona (Syahrizal *et al.*, 2020). Important game purchases like buying online identity, avatar accessories and items occur because of numerous reasons like social norms in the community, social interaction, expression of identity, expectancy of performance and the need to escape from reality (Castronova, 2004; Guo and Barnes, 2009, 2011, 2012; Al Halbusi *et al.*, 2020). Valve's intention in releasing Dota 2 in-game virtual items infrequently aims to influence Dota 2 players' behavior to collect these in-game virtual items. However, there are several studies that have been conducted on factors that influence players' intention to purchase virtual items, for example, Mäntymäki and Salo (2011) and Davis and Lang (2012) studied players' actions toward continuously playing and purchasing behavior in the social networking game.

Similarly, King *et al.* (2020) investigated players purchasing behaviors in the game of Fortnite, while Ghazali *et al.* (2019) studied players purchasing behaviors in the game Pokémon Go. However, although these studies were conducted games *per se*, the virtual purchases that players made are different from those purchased in Dota 2 (Demediuk *et al.*,

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2019). Therefore, this study aims to examine the significant elements like enjoyment, skills, challenge, telepresence toward flow, and subsequently, the effect of flow toward purchase intention of Dota 2 in-game through continuous intention as a key mechanism which is urgently needed to minimize the gap in in-game virtual items literature. Significantly, this study also intends to explore the contingent role of enjoyment of buying on the relation of flow→ purchase intention of Dota 2 in-game and between flow→ continuous intention and finally between continuous intention→ purchase intention of Dota 2.

In response, this study's central research question can be highlighted on testing *how enjoyment, skills, challenge, telepresence and in-game virtual items influence purchasing intention when buying enjoyment moderates the proposed relationship?* In essence, this research aimed to (1) To study whether enjoyment, skill, challenge and telepresence positively influence flow; (2) to examine whether flow has a positive influence on purchase intention through player's continuous intention; and (3) to examine moderating effects of enjoyment of buying on the relationship between flow and purchase intention, flow and continuous intention, and continuous intention and purchase intention. Thus, the article will be structured as follows: literature review and construct development and formulate and develop the study framework and research hypotheses. Following sections will discuss the research methodology adopted. Then, the paper progresses through presenting data analysis and results. The last sections will explain the essential findings and discussion, followed by the theoretical and practical implications, limitations. Finally, paving the way for future research.

## 2. Theory and hypothesis development

### 2.1 Goal-setting theory

Goal-setting is an essential part of human behavior, and it plays a crucial role in actions that need endurance and planning, as is the case with almost all contemporary people' or businesses' operations. Goal-setting is the process through which an individual or a group determines desirable end-states that they want to accomplish and aim to utilize in self-control (Burnette *et al.*, 2013; Loock *et al.*, 2013; Gong *et al.*, 2020). Meaningful goal setting is more crucial than blind optimism. Therefore, the process of goal-setting has been broadly considered (Locke and Latham, 2002; Hamari *et al.*, 2018), and it has been connected to improved performance in a wide variety of settings, including schooling, personal growth and activities. Moreover, goal-setting aids self-regulation, a constant psychological process that requires evaluating one's performance concerning one's goals, allowing more people to refocus their performances as required and stay on track for their desired results (Mann *et al.*, 2013). Self-regulation requires getting a response to appraise performance (Burnette *et al.*, 2013; Ke *et al.*, 2016). As a result, self-regulation (Tanes and Cho, 2013; Ke *et al.*, 2016; Hammood *et al.*, 2021) and goal accomplishment may benefit from systems to allow persons to assess their achievement or provide feedback mechanisms. Nevertheless, not everyone has the same types of objectives or approaches to goal-setting.

### 2.2 Enjoyment and the flow

Concentration, telepresence, delight and temporal distortion, according to Chang (2013), are crucial factors that make up the entire flow experience. Flow also includes fundamental traits such as full participation, enjoyment, control, attention and intrinsic interest, according to Lee and Tsai (2010) and Perttula *et al.* (2017). Players who have experienced flow have reported higher satisfaction levels and positive expectations (Vyvey *et al.*, 2018; Sweetser and Rogalewicz, 2020). Hoffman and Novak (1996) also stated that flow includes intrinsic enjoyment, losing self-consciousness and self-reinforcement. Flow has many factors, for instance, perceived enjoyment, control and concentration (Koufaris, 2002; Hausman and

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Siekpe, 2009). When a person is in the flow state when playing video games, they will have optimal satisfaction levels, according to Liu and Li (2011). Students who experience flow while taking online courses are more likely to consider the course fun. According to Guo *et al.* (2016) and Kim and Song (2020), this demonstrates that as the level of satisfaction rises, so will the inflow. Hence, it is hypothesized that

H1. Enjoyment has a positive influence on the flow.

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### 2.3 Skill and flow

According to Zhou (2015), when flow experience is generated by players when playing a game, their games experience will be enhanced as there is a sense of complete immersion. To obtain the best experience in upcoming gaming sessions, players' flow is an essential factor that will drive players to continue playing. Novak *et al.* (2000) indicate that players' skills are aided by frequent usage. In gaming terms, skill signifies the capability to find a solution. Bonny and Castaneda (2017) and Bitrián *et al.* (2020) state that the longer the player plays a game, the longer they practice and nurture skills explicitly catered to that game. Flow provides an equilibrium between challenges and players' skills (Tian *et al.*, 2017). Players will only experience flow, should the players' skill and the challenges in-game surpass the threshold and have high compatibility with each other. The players must balance skills and challenges to achieve flow and experience immersion and enjoyment in-game. If the players' skill exceeds the game's challenge difficulty, they will get bored of the game; conversely, if the players' skill is inferior to the game's challenge difficulty, they feel frustrated (Shu-Hui *et al.*, 2018; Cowley, 2020). Therefore, it can be postulated that

H2. Skill has a positive influence on the flow.

### 2.4 Challenge and flow

Based on the goal-setting theory (Locke, 1996; Lunenburg, 2011), complex challenges motivate gamers the most, provided that gamers deem the challenging objectives achievable. Suppose the player feels that the challenge is challenging but attainable. In that case, he or she will be much motivated to work harder to overcome that challenge and achieve the objectives (Admiraal *et al.*, 2011; Cheng, 2021); conversely, if the challenge is formidable and unachievable, the player will lack the motivation to strive and overcome that challenge due to the impracticality of it (Michailidis *et al.*, 2018). Therefore, gamers are motivated to play online games more frequently to overcome challenging but achievable challenges. In games, players' skills or abilities are improved by frequent usage (Novak *et al.*, 2000; Ramírez-Correa *et al.*, 2019).

According to Liu and Shiue (2014), in gaming terms, the challenge is defined as difficulty level, wherein multiplayer games refer to competition with other players, and in single-player games, it refers to overcoming the various missions within that game (Granic *et al.*, 2014). Dota 2 is a multiplayer game, and the study deems competition with opposing players, specifically challenge seeking (Ahmad *et al.*, 2019). The main challenge for Dota 2 is to select a team of 5 heroes that plays specific roles, overcoming the enemy team's pick of 5 heroes to destroy the enemy base and win the game eventually (Egliston, 2016; Bratianu and Bejinaru, 2020). Other challenges in Dota 2 include leveling up each hero's mastery by playing the massive number of matches for the heroes of players' choice, enabling opposing players to recognize the individual's expertise on the hero, which serves as an achievement the effort spent to master the hero. Therefore, the previous literature has shown that setting realistic game challenges makes games fun, ensuring the player's best gaming experience (Lee *et al.*, 2018; Teng *et al.*, 2012; Drachen *et al.*, 2014). Players enjoy the challenge when they overcome a mission in-game, which will generate a feeling of accomplishment. Positive challenges play a significant role in preserving an individual's interest and affiliation toward a game (Merikivi *et al.*, 2017). However, the challenge should balance in terms of difficulty; if it is too easy, players might feel bored, while players will be frustrated if it is

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too tricky (Denisova *et al.*, 2017; Zohaib, 2018). According to Su *et al.* (2016), players can experience flow through challenges. Thus, it is hypothesized that

H3. Challenge has a positive influence on the flow.

### 2.5 Telepresence and flow

Telepresence is defined as a sense of being immersed in an environment that seems natural but is not. Telepresence is formed through a synergy of tangibility and immersing in imagination (Hopkins *et al.*, 2004; Hyun and O'Keefe, 2012; Beuckels and Hudders, 2016). When players experience telepresence, they will visualize a realistic experience, albeit imaginary, because of the intense involvement encountered (Huang, 2006; Cuny *et al.*, 2015). Nevertheless, telepresence was applied to examine flow experience in the conceptual model Hoffman and Novak (1996) introduced. Flow has four main components: skills, challenge, telepresence and focused attention (Novak *et al.*, 2000). If a player deems the game as challenging, has the skills to overcome the challenge, experiences an immersion in that environment and is attracted to the game, the player will encounter a flow state. When users go through the gaming flow experience, they respond with better expectations and show more signs of enjoyment and satisfaction (Guo *et al.*, 2016). Researchers have signified that various aspects, including flow, describe users' behavior in various new media technologies like social networking services (Zhou, 2015; Guo *et al.*, 2016), online games (Ming-Chi, 2009; Merhi, 2016; Merhi, 2016) and mobile purchasing (Gao *et al.*, 2015). According to Zhou (2015), flow is affected by elements such as perceived complexity, content quality, social awareness, telepresence and perceived ease of use (Pelet *et al.*, 2017; Kim and Ko, 2019). Hence, it can be hypothesized that

H4. Telepresence has a positive influence on the flow.

### 2.6 Flow and purchase intention

Typically, purchase intention is defined as buying virtual products (Fishbein and Ajzen, 1980) as Hoffman and Novak (1996) argue that flow can be generated through an online shopping environment, which causes an increase in browsing and eventually purchasing. It is also suggested that flow encourages behaviors like browsing, shopping and repeat buying (Smith and Sivakumar, 2004). According to Liu and Shiue (2014), flow is a comprehensive feeling experienced when fully engrossed in an activity. It is suggested that this total immersed feeling influences players to make an in-game purchase, as players are willing to spend to obtain that optimal gaming experience and enjoyment. Thus, the previous studies showed that flow influences purchase intention positively whereby if flow experienced is high, the intention to purchase increases simultaneously (Hamari and Keronen, 2017; Martins *et al.*, 2019). Hence, it is hypothesized that

H5. Flow has a positive influence on purchase intention.

### 2.7 Mediating role of continuous intention

Game providers' primary objective is to ensure that players stay loyal to the game and produce revenue from present or future players through in-game advertising or purchases (Hamari, 2015; Hsiao and Chen, 2016). Although games provide entertainment to players, it is still a business. Nonetheless, game providers must ensure that the game stays sustainable in terms of content and gameplay and generate revenues to succeed (Jamshidi *et al.*, 2018; Shliakhovchuk and Muñoz García, 2020). This relies heavily on the players to continue playing the game and purchase in-game items (Ko and Park, 2020). Purchases in-game can be categorized into two types, one intended to enhance a player's game performance and the

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other intended to enhance the virtual character's avatar's appearance (Chua *et al.*, 2019; Shliakhovchuk and Muñoz García, 2020). According to Mäntymäki and Salo (2011), purchasing behavior can be observed as a more profound user commitment to the service platform. In the context of gaming, virtual items are bought by users to enhance their gaming experience. With this basis, it is assumed that those usage decisions and commitment over time determine the gamers' purchase intentions (Moon *et al.*, 2013; Morschheuser *et al.*, 2017). Thus, players' decision to purchase in-app items is dependent on the intention to continue playing a game (Ghazali *et al.*, 2019; Zhou, 2020). It can be postulated that

*H6.* Continuous intention mediates the relationship between flow and purchase intention.

### *2.8 The moderating effect of enjoyment of buying*

Enjoyment of buying, also known as shopping enjoyment, can be described as the satisfaction that an individual gets through the shopping or buying process (Beatty and Ferrell, 1998). Shoppers gain delight and contentment through shopping (Babin *et al.*, 1994), and they also shop for hedonic such as perceived enjoyment and utilitarian values, such as quality (Jones, 1999). Enjoyment of buying might also influence impulse purchase behavior (Wu *et al.*, 2020; Uzir *et al.*, 2021). According to Hamari *et al.* (2020), freemium services' quality was examined as antecedents for online games' buying behavior. Players that continue playing the game and are enthusiastic about buying in-game items substantially determine a game's financial success and sustainable development. Mäntymäki and Salo (2011) state that purchasing behavior can be observed as a more profound user commitment to the service platform. Hoffman and Novak (1996) argue that flow can be generated through an online shopping environment, which causes an increase in browsing and eventually purchasing. It is also suggested that flow encourages behaviors like browsing, shopping and repeat buying (Smith and Sivakumar, 2004; Hammood *et al.*, 2020). According to Csikszentmihalyi (1990), flow is a comprehensive feeling experienced by a person when fully engrossed in an activity. It is suggested that this total immersed feeling influences players to make an in-game purchase, as players are willing to spend to obtain that optimal gaming experience and enjoyment. Purchase intention is defined as the intention to buy virtual products (Fishbein and Ajzen, 1980). Previous studies done by Animesh *et al.* (2011), Hamari and Keronen (2017) and Wu *et al.* (2018) presented that flow influences purchase intention positively, whereby if flow experienced is high, the intention to purchase increases simultaneously. Therefore, it can be hypothesized that

*H7a.* Enjoyment of buying moderates the positive relationship between flow and purchase intention, such as the relationship is more robust when the enjoyment of buying is high than low.

*H7b.* Enjoyment of buying moderates the positive relationship between flow and continuous intention, such as the relationship is more robust when the enjoyment of buying is high than low.

*H7c.* Enjoyment of buying moderates the positive relationship between continuous intention and purchase intention, such as the relationship is more robust when the enjoyment of buying is high than low.

## **3. Methodology**

### *3.1 Sampling and procedures*

In this study, a non-probability sampling technique was employed, and this technique was the suitable option to achieve a target number of respondents because our sample comprises users (e.g. players of the game Dota 2 or users). Nevertheless, it is difficult to collect

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information regarding that in such a context because the entire information is challenging to manage (Memon *et al.*, 2017; Hulland *et al.*, 2018). Among all types of non-probability sampling design, a purposive sampling design was chosen for this study (Memon *et al.*, 2017; Hulland *et al.*, 2018). Hence, the unit of analysis in this study is the individual level. Therefore, to determine sufficient sample size, we utilized G-Power 3.1 (Faul *et al.*, 2007; Memon *et al.*, 2020). According to Cohen (1992), for a power of 0.95 (at a minimum, it should be greater than 0.80) and a mediating effect size of 0.15, thus, based on the mentioned criteria, this study required 129 cases as minimum sample size test our proposed research model.

The primary data were collected utilizing the survey method via online Google Forms. Remarkably, the online questionnaires were then designed using Google Forms. From October 1, 2019, to October 16, 2019, and these forms of the surveys were distributed via media platforms such as emails, WhatsApp, Facebook, Reddit and Telegram because these websites have the closest reach to gamers, the goal of the survey was to recruit only Dota 2 players. Hence, a filter question of “Do you play Dota 2?” to start the online questionnaire and subsequently data of those who play Dota 2 were filtered in and who did not play Dota 2 were filtered out. Therefore, the proposed hypotheses were tested based on 331 individuals (gamers/users).

### 3.2 Variables measurement

All variables were measured by self-report on multi-item scales derived from previous studies. Therefore, All the measures were assessed by a five-point Likert-type as one representing strongly disagree and seven representing strongly agree in this study. However, the constructs utilized in this research were enjoyment, skill, challenge, telepresence, flow, continuous intention, enjoyment of buying and purchase intention of Dota 2 virtual in-game items, which are described below:

Enjoyment was measured with 5-items adapted from Turel *et al.* (2010). Example of items “Playing Dota 2 is enjoyable”. To measure, Skill 5-items were taken from Huang *et al.* (2017) and Bonny and Castaneda (2017). Example of items “When I play Dota 2, I feel that I am extremely skilled at playing Dota 2”. The challenge was assessed by 5-items adapted from Teng *et al.* (2012) and Kahn *et al.* (2015). Example of items “I feel that playing Dota 2 challenges me”. 5-items were taken from Huang *et al.* (2017) to measure telepresence. Example of items “When I play Dota 2, I feel and think as if I am the hero that I am currently playing”. Flow comprises 4-items, and these items were adapted from previous studies such as (Lee, 2009; Triantafyllidou and Siomkos, 2014). Example of items “When playing Dota 2, time seemed to pass very quickly”. Continuous intention was assessed with 5-items were adapted from Lee and Tsai (2010), Chang *et al.* (2014) and Li *et al.* (2015). Example of items “I intend to continue playing Dota 2 in the future”. The enjoyment of buying was measured with 3-items adapted from Koufaris (2002). Example of items “The owning and equipping of Dota 2 in-game items make me feel good”. Finally, purchase intention comprised of 5-items was adapted from Lee and Wohn (2012). The measurement of respondents’ behavior and motivation is based on the agreement of several statements. Example of items “I intend to buy Dota 2 in-game items in the future”.

## 4. Data analysis and results

This study utilized the partial least squares-structural equation modeling (PLS-SEM) technique using SmartPLS software 3.3.2 (Ringle *et al.*, 2015). The PLS-SEM technique is a powerful and robust technique that can handle complex research models such as mediation and moderation (Becker *et al.*, 2018) and hierarchical-order components with relaxing assumptions regarding the distribution of the data (Hair *et al.*, 2017, 2019).

### 4.1 Demographic profiles of the respondents

Among the respondents’ profiles, 67.4% were men, and 33.0% were females. In terms of their ages, the largest group (41.5%) falls in the range between 25 and 30. With regards to region,

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Europe scored the highest 44.2% and 23.5% followed by others. In addition, the tenure of playing Dota 2 and the hours of playing Dota 2 in a week was checked (see [Table 1](#)). All the details are listed in [Table 1](#).

#### 4.2 Common method variance assessment

Since our data came from a single source, several remedies were recommended by [Podsakoff et al. \(2003, 2012\)](#) were considered in this study to minimize the common method variance (CMV) issue. In particular, we employed both procedural and statistical remedies. Regarding procedural remedies, we first counterbalanced the order of the survey questions to make the variables appear unrelated. Second, we also prepared the questionnaire to make the variables appear to increase the psychological distance between the predictors and the criterion variable. Finally, we ensured that the items were understood by respondents using the pre-test and pilot-test procedures ([Afthanorhan et al., 2021](#)).

Regarding statistical remedies, [Harman's \(1976\)](#) single factor was employed as exploratory factor analysis to adopt an un-rotated principal component factor. Therefore, the variance of the first factor accounts for only 22% of the total variance. Thus, this test suggests CMV is not a serious concern ([Podsakoff et al., 2003](#)). Additionally, a full collinearity test was executed based on variance inflation factors (VIFs) ([Kock and Lynn, 2012](#)).

Items	Characteristics	Frequency	Percentage
Gender	Male	221	67.4
	Female	110	33.0
Age	Less than 25 years	101	35.1
	25–30 Years	113	41.5
	31–40 Years	90	21.2
	41–50 Years	16	11.1
	More than 51 years	11	7.9
	Region	Africa	6
Region	Asia	77	23.5
	Caribbean	5	0.3
	Central America	1	0.3
	Europe	145	44.2
	North America	58	17.7
	Oceania	23	7.0
	South America	16	4.9
	How long have you been playing Dota 2?	About 1–2 years	30
How long have you been playing Dota 2?	About 3–5 years	103	31.4
	About 3–6 months	2	0.6
	About 5–7 years	25	7.6
	About 6–7 years	78	23.8
	About 7–11 months	1	0.3
	About 7–9 years	11	2.7
	About 8–9 years	19	5.5
	About less than three months	2	0.6
How often do you play Dota 2 in a week?	More than nine years	60	18.3
	0–10 h	104	31.7
	11–20 h	119	36.3
	21–30 h	49	14.9
	31–40 h	29	8.8
	41–50 h	15	4.0
	51–60 h	6	1.5
	More than 60 h	9	2.7

**Table 1.**  
Respondents' profiles



This statistical technique was used to detect any potential CMV situation. Kock and Lynn (2012) indicate that when a VIF achieves a value greater than 3.3, there would be an indication of pathological collinearity. This would warn that a model may be contaminated by CMV. However, in our model, as shown in Table 2, the maximum VIF was (1.701); thus, CMV is not an issue in this study.

#### 4.3 Measurement model via SmartPLS

We examined the item reliability, internal consistency reliability, convergent validity and discriminant validity to evaluate the reflective measurement model. Thus, as Table 3 shows, item reliability revealed no serious problems as most items exceeded the recommended 0.708 level (Hair et al., 2017). Only one item of the skill (SK5 = 0.258) was below the recommended value and thus was dropped. We assessed the internal consistency reliability with Cronbach's alpha and composite reliability (CR). Thus, the results showed the Cronbach's alpha ranged from (0.787 to 0.914), and the CR ranged from (0.860 to 0.927), thus surpassing the 0.70 cutoffs in almost all the cases (Hair et al., 2017). For convergent validity, the average variance extracted (AVE) was determined. Convergent validity was confirmed because the AVE for all the constructs ranged from (0.508 to 0.714), thus exceeding the 0.5 thresholds (Hair et al., 2017), and all the items were above 0.5.

Regarding discriminant validity, we uncovered no issues; the AVE for each construct was more significant than the variance that each construct shared with the other latent variables (Table 4) (Hair et al., 2017). Henseler et al. (2015) propose an alternative, more reliable method, the heterotrait-monotrait (HTMT) ratio of correlations, based on a multitrait-multimethod matrix. As Table 4 shows, the HTMT values are below 0.90, which confirms the discriminant validity of each pair of variables. All HTMT values differ significantly from 1, and the 95% confidence intervals (CI) do not include 1 (Henseler et al., 2015), which confirms the discriminant validity of each pair of variables.

#### 4.4 Structural model via SmartPLS: hypothesis testing

Table 5 presents our direct and indirect hypotheses. Regarding our direct effect thus, enjoyment is positively and significantly related to flow ( $\beta = 0.320, t = 4.837, p < 0.000$ ). Hence, H1 is supported. Also, skill has a positive and significant effect on the flow ( $\beta = 0.694, t = 3.901, p < 0.000$ ). Therefore, is accepted H2. The challenge value has a significant effect on the flow ( $\beta = 0.527, t = 7.457, p < 0.000$ ). Thus, H3 was supported. In regard to the relationship between telepresence and flow showed a significant relationship ( $\beta = 0.386, t = 6.467, p < 0.000$ ). Thus, H4 is supported. For (H5), which presents the relationship between flow and purchase intention, showed a positive relationship as per ( $\beta = 0.158, t = 3.228, p < 0.001$ ).

In addition, as we predicted in H6, the continuous intention has significantly mediated the relationship between flow and purchase intention. Thus, using a bootstrapping method with 5,000 subsamples, we found a significant indirect effect of flow on purchase intention through continuous intention (*indirect effect* = 0.533,  $t = 4.104, p < 0.000$ ). Because the 95% CI does not include 0 (*lower limit* = 0.286, *upper limit* = 0.723), we confirm that mediation exists (Preacher and Hayes, 2008). Thus, in explicit support of H6.

Variables	Enjoyment	Skills	Challenge	Telepresence	Flow	Continuous intention	Purchase intention
VIF	1.219	1.701	1.462	2.112	1.524	1.221	1.242

**Note(s):** VIF = variance inflation factor

**Table 2.** Common method bias assessment via full collinearity estimates criteria

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Constructs	Items labeled	Items description	Loading (> 0.5)	Cronbach's alpha (> 0.7)	CR (> 0.7)	AVE (> 0.5)
Enjoyment	E1	Playing Dota 2 is fun	0.798	0.787	0.860	0.606
	E2	Playing Dota 2 is pleasurable	0.856			
	E3	Playing Dota 2 is enjoyable	0.780			
	E4	Playing Dota 2 is exciting	0.878			
	E5	Playing Dota 2 is interesting	0.698			
Skill	SK1	When I play Dota 2, I feel that I am extremely skilled at playing Dota 2	0.693	0.811	0.890	0.508
	SK2	When I play Dota 2, I feel that I have good knowledge regarding Dota 2	0.753			
	SK3	When I play Dota 2, I feel that my skill in playing Dota 2 is superior to the other online games that I play	0.823			
	SK4	When I play Dota 2, I feel that I have a better understanding of Dota 2 compared to other gamers	0.672			
	SK5	When I play Dota 2, I feel that I know how to find what I am looking for in Dota 2	Dropped			
	SK6	When I play Dota 2, I feel that my skill in playing Dota 2 is superior to my skill in playing other games	0.623			
Challenge	CHA1	I feel that playing Dota 2 challenges me	0.833	0.874	0.917	0.687
	CHA2	I feel that playing Dota 2 provides a good test of my skills	0.869			
	CHA3	I feel that playing Dota 2 challenges me to master all elements of the game	0.831			
	CHA4	I feel that playing Dota 2 challenges me to try everything that is possible to do in a game	0.819			
	CHA5	I find that playing Dota 2 challenges me to the best of my ability	0.752			
Telepresence	TEL1	When I play Dota 2, I feel and think like as if I am the hero that I am currently playing	0.884	0.827	0.883	0.655
	TEL2	When I play Dota 2, I feel that my body is in the room, but my mind is in the Dota 2 universe	0.864			
	TEL3	Playing Dota 2 often makes me forget where I am	0.810			
	TEL4	After playing Dota 2, I feel like have I come back to the "real world" after a journey	0.661			

**Table 3.**  
Measurement model,  
loading, construct  
reliability and  
convergent validity

(continued)

Constructs	Items labeled	Items description	Loading (> 0.5)	Cronbach's alpha (> 0.7)	CR (> 0.7)	AVE (> 0.5)	Motivation to purchase in-game items
Flow	TEL5	I forget about my immediate surroundings when I play Dota 2	0.687	0.827	0.883	0.655	
	FLO1	When playing Dota 2, time seemed to pass very quickly	0.884				
	FLO2	When playing Dota 2, my attention is focused on the game	0.864				
	FLO3	When playing Dota 2, I am not aware of things happening around me	0.810				
Enjoyment of buying	FLO4	When playing Dota 2, I am totally absorbed in the game	0.661	0.901	0.924	0.551	
	EOB1	Dota 2 in-game items make me want to own and equip them	0.641				
	EOB2	The owning and equipping of Dota 2 in-game items make me feel good	0.780				
Continuous intention	EOB3	The owning and equipping of Dota 2 in-game items give me pleasure	0.631	0.808	0.911	0.651	
	COI1	I intend to continue playing Dota 2 in the future	0.740				
	COI2	I will keep playing Dota 2 as regularly as I do now	0.803				
	COI3	I will continue playing Dota 2 as much as possible in future	0.736				
	COI4	I expect to continue playing Dota 2 in the future	0.741				
Purchase intention	COI5	I am willing to play Dota 2 in the future	0.759	0.914	0.927	0.714	
	PRI1	I intend to buy Dota 2 in-game items in the future	0.670				
	PRI2	I predict that I will buy Dota 2 in-game items in the future	0.748				
	PRI3	I would consider buying Dota 2 in-game items in the future	0.714				
	PRI4	The likelihood that I will buy Dota 2 in-game items is high	0.743				
	PRI5	I would consider spending real money to purchase Dota 2 in-game items in the Steam store	0.697				

**Note(s):** CR= composite reliability, AVE = average variance extracted (SK5 = 0.258) was dropped due to the low loading

**Table 3.**

Significantly as we predicted enjoyment of buying acts as moderation on the relation of flow and purchase intention 7a, and between flow and continuous intention 7b, and finally between continuous intention purchase intention 7c. Therefore, the proposed moderation was tested as suggested by Hayes (2015, 2017) via SPSS PROCESS MACRO using the given command: PROCESS vars = FL, PI and EJOB as follows ( $y = PI/x = FL/W = EJOB/Model\ 1/center = 1/boot = 5,000$ ) (H7a). For the (H7b) we used the given command: PROCESS vars = FL, CI, PI and ENOB as follows ( $y = PI/x = FL/M = CI/W = ENOB/Model\ 7/center = 1/boot = 5,000$ ).

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Constructs	Mean	SD	1	2	3	4	5	6	7	8
1. Enjoyment	4.511	0.560	<i>0.745</i>	0.704	0.392	0.678	0.197	0.087	0.078	0.060
				[0.662; 0.749]	[0.323; 0.468]	[0.620; 0.731]	[0.157; 0.254]	[0.074; 0.129]	[0.062; 0.137]	[0.052; 0.095]
2. Skill	3.841	0.441	0.316	<i>0.766</i>	0.543	0.794	0.175	0.084	0.122	0.078
					[0.490; 0.607]	[0.758; 0.827]	[0.156; 0.239]	[0.062; 0.147]	[0.103; 0.175]	[0.074; 0.128]
3. Challenge	3.401	0.709	0.339	0.164	<i>0.865</i>	0.570	0.127	0.102	0.057	0.070
						[0.510; 0.631]	[0.103; 0.203]	[0.071; 0.165]	[0.037; 0.111]	[0.036; 0.139]
4. Telepresence	4.140	0.521	0.554	0.292	0.246	<i>0.730</i>	0.180	0.153	0.089	0.104
							[0.152; 0.247]	[0.108; 0.208]	[0.075; 0.127]	[0.096; 0.139]
5. Flow	2.714	0.767	0.049	0.074	0.054	0.074	<i>0.754</i>	0.087	0.051	0.118
								[0.063; 0.132]	[0.030; 0.122]	[0.073; 0.188]
6. Enjoyment of buying	1.742	0.447	0.042	0.076	0.008	0.234	0.047	<i>0.744</i>	0.007	0.015
									[0.003; 0.083]	[0.002; 0.103]
7. Continuous intention	3.193	0.978	0.035	0.031	0.002	0.148	0.113	0.057	<i>0.845</i>	0.268
										[0.206; 0.331]
8. Purchase intention	2.812	1.130	0.043	0.133	0.047	0.061	0.064	0.041	0.101	<i>0.765</i>

**Table 4.** Descriptive statistics, correlation matrix and discriminant validity

**Note(s):** SD = standard deviation; italic values on the diagonal are the square roots of the average variance extracted, shared between the constructs and their respective measures. Off-diagonal elements below the diagonal are correlations among the constructs, where values between 0.12 and 0.15 are significant at  $p < 0.05$ , and values of or higher than 0.16 are significant at  $p < 0.01$  (two-tailed test). Off-diagonal elements above the diagonal are the heterotrait-monotrait (HTMT) ratios of correlations and their respective confidence intervals at the 95% confidence level

Similarly, we the given command: PROCESS vars = FL, CI, PI and ENOB as follows ( $y = \text{PI}$ / $x = \text{FL/M} = \text{CI/W} = \text{ENOB/Model 14/center} = 1/\text{boot} = 5,000$ ) for the (H7c). So, the results of these hypotheses showed that H7a, and H7c was supported while H7b was not supported. First, for the H7a, the result was significant as long as levels of enjoyment of buying are higher: At +1 standard deviation below the mean (high enjoyment of buying), the positive effect is stronger ( $B = 0.514$ ,  $SE = 0.055$ , 95% CI = 0.410, 0.524) than at -1 standard deviation above it (low enjoyment of buying) ( $B = 0.305$ ,  $SE = 0.027$ , 95% CI = 0.230, 0.417). Also, the index does include 0 (index = 0.171,  $SE = 0.037$ , 95% CI = 0.164, 0.344) (see Table 6). For H7b the condition was not met as Table 7 revealed that enjoyment of buying levels is higher: at -1 standard deviation (low enjoyment of buying) ( $B = 0.261$ ,  $SE = 0.087$ , 95% CI = 0.181, -0.40) than at +1 standard deviation (high enjoyment of buying) ( $B = 0.152$ ,  $SE = 0.064$ , 95% CI = -0.133, 0.366). Besides, the index of moderated mediation does include zero (index = 0.188,  $SE = 0.049$ , CI = -0.156, 0.263). Thus, enjoyment of buying does not moderate indirect effect of flow on purchase intention through continuous intention. Hence H7b is not supported. Finally, we found that the positive indirect effect of flow on purchase intention via continuous intention differs at distinct levels of enjoyment of buying as the moderator. Thus, Table 8 detailed how the positive indirect effect matches our prediction when enjoyment of buying levels is as follows: At -1 standard deviation below the mean (low enjoyment of buying), the positive effect is weaker ( $B = 0.152$ ,  $SE = 0.061$ , 95% CI = 0.131, 0.367) than at +1 standard deviation above it (high enjoyment of buying) ( $B = 0.283$ ,  $SE = 0.087$ , 95% CI = 0.188, 0.412). Finally, the index does not include 0 (index = 0.186,  $SE = 0.045$ , 95% CI = 0.156, 0.263), which meets the condition and provides evidence of moderated mediation (Hayes, 2015). Thus, enjoyment of buying strengthens the positive indirect effect of flow on purchase intention via continuous intention, which is clear that support of H7c.

Motivation to purchase in-game items

Hypothesis	Direct effect	Std beta	Std error	<i>t</i> -value	<i>p</i> -value	Bias and corrected bootstrap 95% CI		Decision
						LL 95% CI	UL 95% CI	
H1	Enjoyment → Flow	0.320	0.066	4.837	0.000	[0.286	0.723]	Supported
H2	Skill → Flow	0.694	0.029	3.901	0.000	[0.121	0.699]	Supported
H3	Challenge → Flow	0.527	0.071	7.457	0.000	[0.030	0.642]	Supported
H4	Telepresence → Flow	0.386	0.060	6.467	0.000	[0.275	0.475]	Supported
H5	Flow → Purchase intention	0.158	0.049	3.228	0.001	[0.051	0.249]	Supported

Hypothesis	Indirect effect	Std beta	Std error	<i>t</i> -value	<i>p</i> -value	Bias and corrected bootstrap 95% CI		Decision
						LL 95% CI	UL 95% CI	
H6	Flow → Continuous intention → Purchase intention	0.533	0.130	4.104	0.000	0.286	0.723	Supported

**Note(s):** *N* = 331. Bootstrap sample size = 5,000. SE = standard error; LL = lower limit; CI = confidence interval; UL = upper limit 95% bias-correlated CI

**Table 5.** Structural path analysis: direct, indirect and interaction effect

Moderator: enjoyment of buying (H7a)	Direct effect	Boot SE	Bias and corrected bootstrap 95% CI	
			LL 95% CI	UL 95% CI
-1 standard deviation (-0.517) at the mean (0.00)	0.305	0.027	0.230	0.417
+1 standard deviation (0.517)	0.447	0.037	0.351	0.494
	0.514	0.055	0.410	0.524

Index of moderation	SE	Bias and corrected bootstrap 95% CI	
		LL 95% CI	UL 95% CI
0.171	0.037	0.164	0.344

**Note(s):** *N* = 331. Bootstrap sample size = 5,000. SE = standard error; LL = lower limit; CI = confidence interval; UL = upper limit 95% bias-correlated CI

**Table 6.** Conditional on the direct flow on purchase intention at values of enjoyment of buying

In order to interpret this interaction, we followed Dawson (2014) and plotted high versus low enjoyment of buying regression lines (+1 and -1 standard deviation from the mean). Therefore, this step indicates that the positive relationship between flow and purchase intention is stronger (slope is more pronounced) when the enjoyment of buying is high rather than low (Figure 1, H7a). Similarly, enjoyment of buying has positively moderated the relationship between continuous intention and purchase intention, such as that the relationship is more remarkable when the enjoyment of buying is higher than low (see, Figure 2, H7c). Regarding H7b showed that an insignificant interaction of flow and continuous intention. Hence, it is unimportant to plot the interaction (Dawson, 2014).

Moderator: enjoyment of buying (H7b)	Indirect effect	Boot SE	Bias and corrected bootstrap 95% CI	
			LL 95% CI	UL 95% CI
-1 standard deviation (-0.709) at the mean (0.00)	0.261	0.087	0.181	-0.411
	0.211	0.039	-0.142	0.294
+1 standard deviation (0.709)	0.152	0.064	-0.133	0.366

**Table 7.**

Conditional indirect effect of flow on purchase intention via continuous intention at values of enjoyment of buying

Index of moderated mediation	SE	Bias and corrected bootstrap 95% CI	
		LL 95% CI	UL 95% CI
0.188	0.049	[-0.156	0.263]

**Note(s):** *N* = 331. Bootstrap sample size = 5,000. SE = standard error; LL = lower limit; CI = confidence interval; UL = upper limit 95% bias-correlated CI

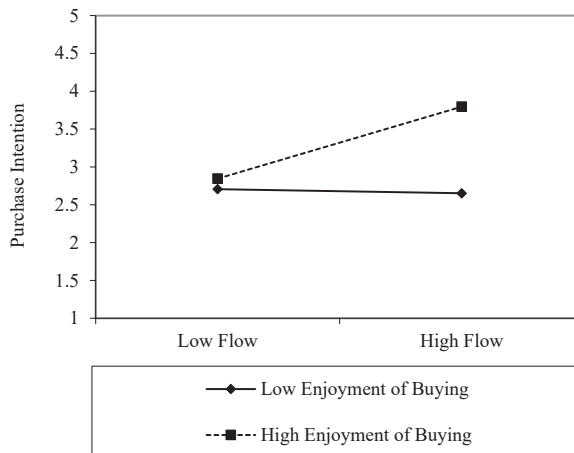
Moderator: enjoyment of buying (H7c)	Indirect effect	Boot SE	Bias and corrected bootstrap 95% CI	
			LL 95% CI	UL 95% CI
-1 standard deviation (-0.509) at the mean (0.00)	0.152	0.061	0.131	0.367
	0.214	0.032	0.147	0.293
+1 standard deviation (0.509)	0.283	0.087	0.188	0.412

**Table 8.**

Conditional indirect effect of flow on purchase intention via continuous intention at values of enjoyment of buying

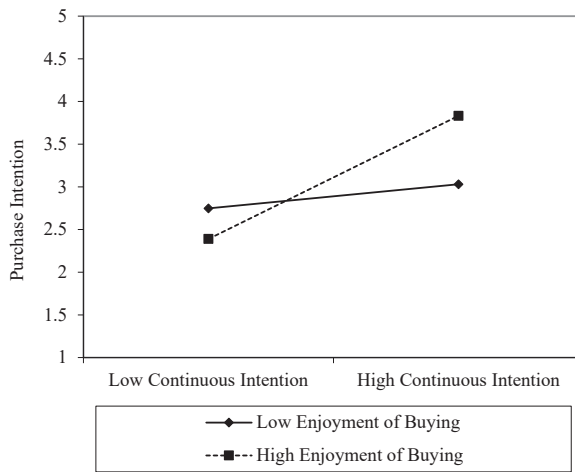
Index of moderated mediation	SE	Bias and corrected bootstrap 95% CI	
		LL 95% CI	UL 95% CI
0.186	0.045	0.156	0.263

**Note(s):** *N* = 331. Bootstrap sample size = 5,000. SE = standard error; LL = lower limit; CI = confidence interval; UL = upper limit 95% bias-correlated CI



**Figure 1.**

Interaction plot of flow and enjoyment of buying on the purchase intention



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**Figure 2.** Interaction plot of continuous intention and enjoyment of buying on the purchase intention

#### 4.5 Assessment of coefficient on determination ( $R^2$ value), predictive relevance $Q^2$ and goodness-of-fit (GoF) assessment

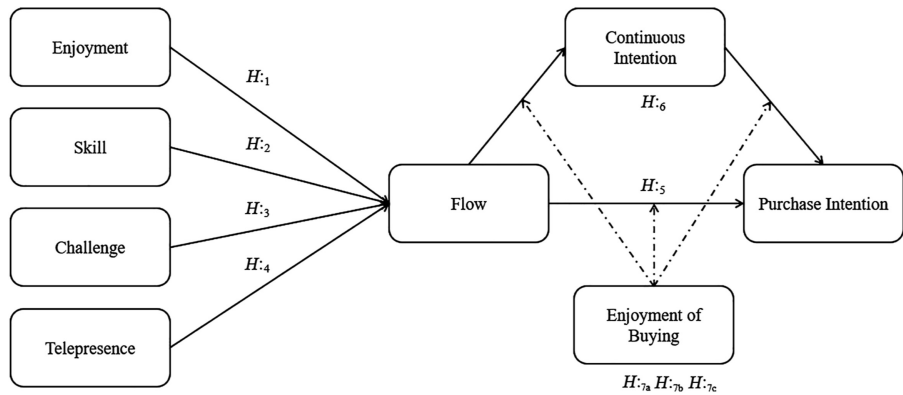
Regarding the explanatory power of the suggested model, the model explains ( $R^2 = 0.521$ ) of the total variances in purchase intention. Thus, according to Hair *et al.* (2017), this model implies a moderate to large effect on this variable. In addition, the Stone-Geisser blindfolding sample reuse technique revealed a  $Q$ -square value greater than 0; thus, the model effectively predicts purchase intention ( $Q^2 = 0.231$ ) (Hair *et al.*, 2017). Finally, we also checked the overall goodness-of-fit (GoF). The SRMR index (standardized root means square residual) had a value of 0.033, far below the cutoff of 0.08 (Henseler, 2017). Additionally, the SRMR's 95% bootstrap quantile is 0.057 and, thus, is higher than the SRMR value, indicating that the model has a good fit (Hair *et al.*, 2017). The discrepancy indexes dULS (unweighted least squares discrepancy) and dG (geodesic discrepancy) are also under the bootstrap-based 95% percentile (dULS = 1.431 < HI 95 of dULS = 2.512; dG = 0.564 < HI 95 of dG = 0.989) (Hair *et al.*, 2017). Overall, the discrepancy between the empirical and model-implied correlation matrix is nonsignificant, suggesting that there is no reason to reject the model and that the tested model is likely valid (Henseler, 2017).

## 5. Discussion and conclusion

This study investigated the relationship of predictors (i.e. enjoyment, skill, challenge and telepresence) and flow. Subsequently, we examined the influence of flow on a player's continuous intention and the direct and indirect effect on purchase intention. Importantly, this study analyzed the moderating effects of buying enjoyment on the relationship between flow and purchase intention, flow and continuous intention, and continuous intention and purchase intention (see Figure 3). However, as indicated, we found that (enjoyment, skill, challenge and telepresence) have a positive influence on flow. On the other hand, the result of the mediation effect showed that continuous intention positively mediated the relationship between flow and purchase intention.

Interestingly, the results also indicated that the customer's enjoyment of buying can intensify the positive impacts of flow and purchase intention (7a) and between continuous intention and purchase intention (7c). In contrast, the relationship between flow and continuous intention was not supported (7b). The result was significant as long as levels of enjoyment of buying high than low.

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**Figure 3.**  
Research framework

### 5.1 Theoretical implications

This study contributes to the extant literature in various ways. First, this research mainly contributes regarding its studies on why players are motivated and intending to purchase Dota 2 in-game instead of focusing on why players look to continue playing the game of Dota 2, which originates from nostalgic elements, plays an essential part in enticing a player to utilize their money to purchase Dota 2 in-game items. This study focused on flow's key elements (e.g. enjoyment, skill, challenge and telepresence). Also, the player's continuous intention was identified as a critical mechanism between flow and purchase intention, which considered this study is one of the fewer studies that has tested this relationship. Most importantly, prior studies have overlooked the enjoyment of buying as a conditional variable. Thus, this introduced enjoyment of buying as a contingent element on the multiple relations such as continuous intention and purchase intention, between flow and continuous intention, and finally, between continuous intention and purchase intention. In addition, the study addresses the motivation of purchases from gamers' viewpoint and allows players to understand better what motivates them to purchase Dota 2 virtual in-game items. As a whole, this study aids further understanding of consumer behavior in the gaming context (Putra *et al.*, 2019).

The theoretical implication of the current study lies in a further understanding of why players are motivated and intending to purchase Dota 2 in-game instead of focusing only on why players look to continue playing the game of Dota 2. This study also contributes to the originates from reflective elements, which play an essential part in enticing a player to utilize their money to purchase Dota 2 in-game items. The findings of this study are helpful for game companies, especially valve. The company is highly recommended constantly introducing new in-game items to entice new players while retaining the current pool. Furthermore, new releases will arouse the enjoyment of buying and need to collect elements of the players, and players, in turn, will seek to collect the complete set and enjoy purchasing items from the game they love most. This study opens a new window for future studies by including promotion or other advertising aspects by expanding the findings.

### 5.2 Managerial implication

This research tries to aid game developers to have a deeper understanding of their games' player behavior toward virtual in-game item purchases, specifically to the valve by providing



insights regarding the behavior of players toward their virtual in-game releases and enabling them to take suitable actions to overcome non-purchasing players' resistance to purchase virtual in-game items as well as increasing the purchases of existing players that are willing to spend money in Dota 2 (Georgen, 2015). In the long run, the valve can look to continuously introducing new varieties of in-game items to entice new players to play Dota 2 and also retain the current pool of players playing Dota 2, simultaneously increasing the possibility of additional virtual in-game item sales as the chances of players purchasing virtual in-game items increases when the number of players increases.

The findings, therefore, obtained from this research have brought about several significant findings related to the factors influencing player behavior and motivation to purchase Dota 2 virtual in-game items. Thus, to certify further success in terms of Dota 2 in-game items sales, various actions require implementations. The results of this research can be explained to the valve so that the corporation constantly introduces new varieties of in-game items to entice new players to play Dota 2 and retain the current pool of players playing Dota 2. The enjoyment of buying and the need to collect elements of the players will be aroused by new releases, as players want to collect a complete set of these items coupled with the enjoyment of buying items from the game they love most. Besides this, the valve can be advised to focus further on Dota 2's gameplay mechanics, like enjoyment, skill, challenge, telepresence and flow elements play the leading role in players' continuous intention, contributing to eventual purchase intention players toward Dota 2 in-game items.

Furthermore, cost efficiency and features fit for customers' needs are significant components of developing the system. While it may appear that providing more features increases the likelihood that a complete and comprehensive design will conform to users' diverse needs, consumer and social psychology investigation has shown that richness of features overwhelms users, leading to dissatisfaction with a service, as well as posing a threat to the economic viability of a service. As a result, user modeling and user-adapted interactivity are important ways of addressing these issues. Studies show that customized designs (op den Akker *et al.*, 2014) and a certain degree of personalization in design are usually more significant than standard patterns for a broad user base.

### 5.3 Limitations and future research

Even though this study showed exciting theoretical results, a few limitations also emerged. As a few limitations restrict the present study, this provides avenues for future studies and recommendations (Al Halbusi and Tehseen, 2017). Therefore, further research should provide future improvement. Firstly, this research was conducted via convenience sampling, with each questionnaire being circulated online. The data collected were mostly from respondents residing in the United States of America (16.01%), followed by Germany (6.34%), Malaysia and India (both 6.04%). Most respondents were from Europe, with only one respondent from Central America and the Caribbean (0.30%). The sample comprised chiefly young respondents, with a vast majority from 25 and below: under 20 (22.96%) and age 21–25 (42.60%). Besides that, most of the respondents preferred not to disclose their approximate salary (25.68%), while the next majority had a salary package of below \$500 (20.24%), followed closely by a salary package of \$2,501 and above (16.62%). Hence, the study sample that was used did not reflect the actual structure of the gamer population globally. Therefore, the sample data collected in future research should better represent the gamers' population globally. Besides this, the questionnaires should be distributed through various platforms and not solely online.

A second limitation of this study results from our cross-sectional data design, making it difficult to establish strong inferences about causality. However, the data collection asked customer continues and purchase intention of Dota 2 virtual in-game, which requires

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assurances of a full long time of adaptation. Thus, the opportunities for longitudinal analyses are limited, preventing more precise causality assessments (e.g. Podsakoff *et al.*, 2003; Podsakoff *et al.*, 2012). Alternative experimental or longitudinal designs that can preserve the causality of participants would be helpful to confirm the causality that we anticipate with our study findings.

Third, we did not address other potentially influential external factors. Player behavior and motivation is a highly complex phenomenon. Thus, future research should also investigate other factors influencing player behavior and motivation to purchase Dota 2 virtual in-game Items. For instance, future research can include promotion or advertising factors to understand further factors that influence player behavior and motivation to purchase Dota 2 virtual in-game Items. Also, the disposable income of consumers can be included in future researches as a moderating variable that influences player behavior and motivation to purchase Dota 2 virtual in-game Items. Considerably, future research can be conducted utilizing the qualitative approach such as interviews to achieve a broader understanding of factors that influence player behavior and motivation to purchase Dota 2 virtual in-game Items. The qualitative approach will help aid the efficiency of future researches by decreasing the likelihood of factors influencing player behavior and motivation to purchase Dota 2 virtual in-game items being under-reported. Also, cross-national studies can be executed to test the effects of socioeconomic and culture on factors influencing player behavior and motivation to purchase Dota 2 virtual in-game items.

#### 5.4 Conclusion

In the current study, we have investigated the essential elements of the purchase intentions of Dota 2 virtual in-games. This study investigated how aspects such as (enjoyment, skills, challenge, telepresence and flow) influence players' buy intentions for Dota 2 virtual in-games and the impact of flow on Dota 2 purchase intentions via a crucial mechanism, i.e. (continuous intention). Notably, the study explored that the moderating role of enjoyment to buy on the relationship between (a) flow and purchase intention in Dota 2, (b) flow continuous intention and (c) continuous intention purchase intention in Dota 2. Therefore, we found that enjoyment, skill, challenge and telepresence positively influenced flow. Also, the flow was significantly related to purchase intention. The continuous intention has significantly mediated the relationship between flow and purchase intention. Considerably, this study found that the moderating role of buying enjoyment increases the relationship between flow and purchase intention and between continuous intention and purchase intention (H7c). In contrast, the moderating role of buying enjoyment on the relationship between flow and continuous intention was not supported. Hence, this study sheds new light on the notable Dota 2 in-game and continuous intention purchase intention of the users.

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