Chapter 3
Acceptance of Virtual Reality Games:
A Multi-Theory Approach

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ABSTRACT

As virtual reality (VR) games are getting more widespread, the need to understand the interaction between players and the VR games is gaining prominence. The present study examines player endorsement of virtual reality games from an amalgamation of technology acceptance, self-determination, and flow theory perspectives. A survey was carried out with participants (N = 396) who had played a VR game at least once and at most five times. Structural equation modeling analyses showed that perceived ease of use was the primary predictor for satisfaction of self-determination constructs (autonomy and competence) and flow constructs (immersion and concentration), which in turn predicted player enjoyment. Accordingly, the results suggest the importance of including self-determination constructs in addition to the flow perspective within the context of technology acceptance model, for explaining the acceptance of VR gaming. Findings also showed that enjoyment resulted in positive attitudes towards VR gaming, and these attitudes predicted intention to play VR games.

INTRODUCTION

Virtual Reality (VR) is defined as "A high-end user-computer interface that involves real-time simulation and interactions through multiple sensorial channels." (Grigore and Coiffet, 1994). Providing a higher display and interaction fidelity with respect to regular devices, VR creates a heightened presence and engagement in humans, which make this technology attractive (McMahan et al., 2012; Steed et al., 2016). In general VR is identified with head mounted displays and it was found that head mounted displays are different than desktop monitors in terms of user satisfaction (Santos et al., 2009), arousal, task performance or presence (Kim et al., 2012). These differences signify the prominence of studying the use of VR in addition to the use of traditional devices. In addition to head mounted displays, olfactory stimulation is being integrated to VR systems as well (Feelreal, 2018). VR market is growing (Grand View Market, 2017) and with the investments of key players such as Microsoft, Sony or Nintendo, the cost of the technology will be diminishing in time making the hardware more affordable and VR technology will be reaching a broader audience (Kozlova, 2017). More people are interacting with the VR technology than ever making it important to delineate the factors associated with VR use. VR devices require software to run on them to be functional and the content provided on the software is critical for the overall VR market success (Martin, 2018). Therefore, companies provide software development kits (SDK) for developers to build their own content and contribute to the VR market (i.e. Google VR API).

Gaming is viewed as one of the main driving force for the development and adoption of VR technology in general (Sackville, 2018). Although VR technology can be used for non-leisure purposes such as training or treatment, currently users are more likely to adopt VR devices and consume VR games for leisure use such as gaming. It is reported that VR gaming market is at an increasing trend (Statista, 2016). In present day, VR games come in a variety of genres such as horror games (i.e. Edge of Nowhere), first-person shooter games (i.e. Doom) or role-playing games (i.e. Fallout 4) (Gurwin, 2018) where this variety attracts more players. In addition to personal spaces such as homes, these games are being experienced at VR gaming centers which are places where people can rent VR devices and play (Xiong, 2019; Castillo 2018). This might be another enabler for mass adoption of VR technology for society, resembling internet cafes helping the wide adoption of internet (Lee, 1999).

Hardware for VR is already with us for several decades now (O'Boyle and Willings, 2019). Nevertheless, VR game practitioners and potential investors are facing a major challenge. This challenge is referred as the "content problem" in VR domain and it is described as the scarcity of software and applications that support VR equipment (Matney, 2018). Once end users buy VR equipment, they can quickly exhaust what is available on the market. The shortage of VR applications creates opportunities for businesses. However, it is also a challenge to enter the market since it is a relatively unexplored territory. The lack of knowledge on how VR can be engaging, hinders the proliferation of VR gaming market. For VR gaming to break its current boundaries and become more prevalent, mainstream adoption is required and the users should be encouraged for continued use (ARVRtech, 2019). For that, the "content problem" needs to be solved (Bilyk, 2018). At this point, developers and managers need assistance to make informed decisions on what content should be produced and how this content translates to user motivations, enjoyment and positive player experiences (Bilyk, 2018). With this knowledge, they would feel less hesitant and can enter the market more courageously. Therefore, to create knowledge on VR gaming adoption, this study aimed to bring a perspective on VR gaming player experiences and reveal the factors which might be essential for VR gaming acceptance.

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