Chapter 8
Three Perspectives on Video Game Learning: Behaviorism, Cognitivism, and Constructivism

Zeynep Tanes
Duquesne University

ABSTRACT
Video games and gamified applications have been used for various purposes including helping businesses (in commercial marketing), or helping the individual, community or society (in social marketing). Video games are systems with rules, play structures, and narratives; while gamified applications utilize game elements, mechanics, and ways of thinking to generate meaningful, playful and fun experiences. Both video games and gamified applications require a learning process including learning to play, and learning through the game. This chapter advocates that learning is an inherent component of video games and gamified applications. The main purpose of this chapter is to examine the concept of ‘game learning’ from three major theoretical positions, namely Behaviorism, Cognitivism, and Constructivism. In doing so, this chapter first explains, compares, and contrasts these three positions, then elaborates on how learning takes place in specific games designed for commercial and social marketing with the lens of these three positions.

INTRODUCTION
As a classical definition, Salen and Zimmerman (2004) describe a game as “a system in which players engage in an artificial conflict, defined by rules, that result in a quantifiable outcome” (p.80). When games are digitalized, they provide immediate but narrow interactivity, manipulate information, allow automated complex systems and networked communications (Salen & Zimmerman, 2004). Based on this definition, video games are simplified and rule based digital worlds, which allow individuals to grasp a simplified version of a phenomenon fully through interactivity and engagement. Furthermore, games not only physically but also emotionally engage players through interaction (Kapp, 2012). Malaby (2007)
further suggests that games are not all about rules, conflict, and outcomes, and should not be separated from the process of play that allows players to “become” through interpretation of the game. In these and many ways, video games are transformative devices that allow individuals to not only learn to play the game, but also learn the game content through playing the game (Ang, Avni & Zaphiris, 2008).

Literature demonstrates an expanding scope of video games used in commercial and social marketing such as entertainment and serious games (Kotler & Lee, 2008; Lucas & Sherry, 2004; Susi, Johannesson, Backlund, 2007). Not only video games, but also gamified applications have been created for entertainment as well as serious purposes (Groh, 2012). Such gamified applications (either digital or not) derive from a more recent concept of “gamification” defined as “the use of game design elements in non-game contexts” (Deterding, Dixon, Khaled, Nacke, 2011, 9) to generate joy, satisfaction and added value to the experience (Deterding, 2014; Huotari & Hamari, 2012). For the player, each type of game and application satisfies a different kind of need they seek from their media engagement. For the developer, the games and gamified applications can be designed for commercial or social gains, leading to attitudinal and behavioral changes either profiting the company or the individual (and ultimately the society as a whole) respectively. It must, however be noted that in any category of game and gamified application, players engage in a learning process that is inherent to gameplay.

Gaming in general and video games in particular have been increasingly recognized as valuable tools for teaching and learning (Egenfeldt-Nielsen, 2006; Federation of American Scientists, 2006; Greenfield, 1984; Lieberman, 2006; Randel, Morris, Wetzel, & Whitehill, 1992; Simoes, Redondo & Vilas, 2013; Shaffer, Squire & Gee, 2004). Scholars suggest that video games are good learning tools for various reasons, including a heightened level of engagement, adoptability to the learner, and reinforcement of the content, due to their unique appeals that challenge players in observation and problem solving while demanding a set of cognitive skills from players (Leach & Sugarman, 2005; Lieberman, 2006). Moreover, if gamification is well integrated into the curriculum, the experience can create favorable outcomes (Simoes, Redondo & Vilas, 2013). All in all, gaming (video games or gamified applications) and learning are inherently connected.

Ertmer and Newby (1993) argue that three main theoretical positions, namely behaviorism, cognitivism, and constructivism dominate the scholarship examining learning. Educators use these theoretical positions to determine how they will structure their instructional designs, and which techniques they will incorporate in those designs. All three of these positions build on each other; yet differ in terms of their perspectives on how learning occurs, which factors influence learning (environmental, personality, cognitive, and situational factors), how memory functions, how transfer of knowledge form one context to another works, as well as what types of learning take place (Ertmer & Newby, 1993).

Behaviorist, cognitivist, and constructivist approaches complement each other in explaining learning from video games and gamified applications. From the behaviorist perspective learning from video games is primarily accidental, where the player inadvertently clicks on the screen to receive some positive or negative reinforcement to modify behavior. With this approach, games and gamified applications simply integrate game elements and mechanics to influence behavior. From the cognitivist perspective learning from video games is a cognitive investment. The player makes observations and conducts hypothesis testing throughout the game that modifies not only their behavior, but also the strategies they employ to achieve specific results. With this approach, games and gamified applications integrate not only game elements and mechanics, but also gaming principles, heuristics, and processes to generate a game-like thinking, and as a result, changes in attitudes and behavior (see Groh, 2012; Kapp, 2012). From the constructivist framework, learning from video games is an interpretive and social phenomenon that re-