

Chapter 7

Perceptions of Gender Stereotypes About Computer Game-Based Learning Among Pre-Service Teachers: Development and Initial Psychometric Analysis of a Scale

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ABSTRACT

The purpose of the present study is to develop a scale for measuring pre-service teacher perceptions of gender stereotypes about computer game-based learning, and conduct a preliminary study to explore the reliability and validity of the scale. Data was collected via survey from 119 pre-service teachers enrolled in a mathematics methods class at a mid-western university. Results of data analysis provided strong support for the reliability of the scale and partial support for its validity. Consistent with our hypotheses, perceptions of gender stereotypes were negatively related to computer gaming experience, gamer identity, and intention to use computer game-based learning in future teaching practice. At the same time, perceptions of gender stereotypes were positively related to perceived barriers to computer game-based learning. Factor analysis suggested a four-factor structure pertaining to four aspects of gender stereotypes with favorable perceptions towards male gamers: intrinsic motivation, competency, confidence, and game compatibility.

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INTRODUCTION

The proceeding two decades have witnessed exponential advancement in digital technologies and its widespread, long-lasting effects on all aspects of our lives. Digital devices and applications that used to be luxury items or status symbols, such as smartphones and high-speed Internet, have suddenly become basic household necessities that are affordable and accessible to most if not all U.S. families. As a result of such digital innovations, the gaming industry has experienced unprecedented growth since its last crash in the 1980s and reached a record-breaking revenue of \$43.4 billion, according to a national survey by the Entertainment Software Association (ESA, 2019). More and more Americans, especially the younger ones, become gamers. ESA (2019) reports that 75% of Americans have at least one gamer in their household. A finding by NPD research group (2011) made headlines: 91% of U.S. children and teens age 2 to 17 were gamers. Computer and video games have become Americans' favorite pastime. NPD (2018) reports that U.S. gamers age 2 and above spent 12 hours per week on average playing video games. ESA (2019) finds that adult gamers spend 4.8 hours per week playing with others online versus merely 3.5 hours in person. ESA also reports an increase in game complexity and flexibility, with gamers playing different genres of games (e.g., casual, action, shooter, etc.) on a variety of gaming devices (e.g., smartphones, personal computers, gaming console, etc.).

Game-Based Learning

As computer and video games become an integral part of American culture, their potential for educational applications is increasingly recognized and advocated. More and more people want to better understand how to harness the power of games for learning. Experts believe that the many cognitive, motivational, emotional, and social benefits of gameplay should and can be generalized to educational settings (Granic, Lobel, & Engels, 2014; Tobias, Fletcher, Dai, & Wind, 2011). In recent years, game-based learning (GBL) has emerged as a paradigm for instructional innovations across all disciplines and educational levels. Research shows that GBL is associated with better academic achievement and motivation among the students, compared to conventional educational approaches (Tobias et al., 2011). However, educational benefits of GBL are neither evident nor consistent when educators focus too much on linear, drill-and-practice games. Open-ended, exploratory, user-guided games are superior for learning (Dedeaux & Hartsell, 2018). A literature review by Mayer (2019) concluded that computer games are most promising for learning benefits when they are used for training specific cognitive skills (perception, attention, mental rotations, etc.) or for teaching specific content areas (science, mathematics, second languages, etc.), and when their design incorporates enhancing features such as modality, personalization, pretraining, coaching, and self-explanation.

Gender Gap and Gender Stereotypes in Gaming

Gender differences among gamers have been observed in terms of preferences for game genres and gaming devices. ESA (2019) reports that among millennial gamers of 18-34 years old, males often play on their game console, while females often play on their smartphone. More male millennial gamers prefer playing games with friends than females (66% vs. 45%). While both male and female gamers enjoy racing games, males generally show more preference for action games such as sports and first-person shooter games, while females prefer casual games such as puzzle games and party games. When researchers

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