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Constituting, testing and validating the gender learner profiles of serious game participants

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ABSTRACT

Though it may be commonly believed that well-developed gender-based learner profiles exist, this is far from the case. This research is focused on compiling complete profiles for female and male learners from a dated and piecemeal literature and validating them for participants of serious games. Two hundred twenty undergraduate business students played *The Marketing Game!* and completed exit surveys soliciting their attitude toward the game experience on four learning dimensions that serious games teach, as well as an inventory designed to reveal learning styles. Results establish empirical support for the gender-based learner profiles of serious game participants on all hypothesized learning dimensions. Theoretical and pedagogical implications are discussed.

1. Introduction

A significant literature references the widely held belief that females and males learn differently. However, a review of the literature that underpins this belief leads us to conclude, surprisingly, that it is not well-founded. That literature, though sizeable, is incomplete, piecemeal and unclear, and there are as yet no definitive sources that provide complete and unequivocal learner profiles for both genders.

For example, our review of the literature indicates that the most commonly referenced work on gender learning profiles remains Gilligan (1982, 1993), a fine work that is a seminal resource. Nonetheless, Gilligan and other studies dealing with gender-based differences in learning are limited for several reasons. They are dated. They are qualitative research, and not empirically generalizable. They are narrow in scope - examining, for example, a small number of female Harvard doctoral candidates (Gilligan, 1982; 1993). They speak more directly to gender-based behavioral profiles rather than learner profiles per se. They offer a far less developed profile of men than women, who were the primary focus of the literature at the time the studies were conducted (for a review, see Pearson, 1992), as is evidenced by the following quotation:

“The subject of gender differences is fraught with dangers. For many people, any suggestion of difference immediately brings to mind a hierarchy where one group is better and the other worse. Women fear that noticing gender differences will mean that women will be seen as having “special needs” which need remediation or that they will be viewed as polar opposites of men. However, since ignoring difference has a price for women - especially those women most unlike the men who set the norm - it is important to address the issue. The challenge then is to confront it, insofar as possible, in its full complexity. We do not have to all

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be the same to be equally important. Perhaps the most cutting-edge development in education today is the understanding of different gifts. When we understand that people learn differently, it opens the possibilities of tapping everyone's true potential" (Pearson, 1992, p. 2).

The early gender learning profiles based on qualitative research such as Gilligan's do offer some consistency as to the behavioral and learning profiles of women and, to a lesser extent, men, and do form the basis for the duly held beliefs of today. However, subsequent efforts to find empirical confirmation of them are far less consistent, failing to take us much past Gilligan, and certainly fall short of providing a definitive set of gender-based learner profiles.

What does exist in the way of empirical research is very much a mixed bag whose findings are difficult to reconcile for several of reasons. First, most of this empirical research examines aspects in narrow frames – e.g., students at certain grade levels within specific disciplines—with little overlap (for reviews, see Brew, 2001; Honigsfeld & Dunn, 2003; McCabe, 2014; and Severiens & ten Dam, 1994). Secondly, most studies examine certain learning dimensions but not all those that would constitute comprehensive female and male learner profiles.

Thirdly, a number of disparate learning style inventories have been applied (McCabe, 2014). These can differ widely in terms of the learning theories upon which they are based and the learning dimensions into which they are decomposed. For example, the Kolb Learning Styles Inventory (Kolb, 1984) profiles learners on the basis of cognitive dimensions; whereas, in contrast, the Productivity Environmental Preference Survey (PEPS) (Dunn, Dunn, & Price, 1996) profiles learners according to the environmental conditions in which students prefer to learn (sound, light, temperature, room design), “emotional” factors that contribute to or inhibit learning (motivation, persistence, responsibility, structure), and social context (preference for learning alone, in pairs, with peers, with teachers, or mixed). Thus, it is hard to generalize on the results of these studies. For a review of available learning style inventories and the dimensions they propose, see Ramayah, Sivanandan, Nasrijal, Letchumanan and Leong (2009).

And, further, results of different studies are at times mixed or contradictory (McCabe, 2014). Finally, means of analysis are often superficial or unsophisticated – e.g., correlations and other univariate methods – and may not get from the data all that is there.

In this paper, we extend the examination of gender based learner profiles to the participants of serious games. Specifically, we: (1) review the literature on gender based learning styles; (2) develop a set of hypotheses, which if supported in their entirety, would define gender-based learner profiles for serious game participants; (3) provide an empirical test of the hypotheses; and, (4) discuss theoretical and pedagogical implications.

2. Kolb's Experiential Learning Theory and gender-based learning

Even though we argue that the results of prior empirical research examining gender-based learning profiles is piecemeal and conflicting, our review of the literature does reveal a pocket of reliability, namely those studies based on Kolb's Experiential Learning Theory (Kolb, 1984) and measured with his Learning Styles Inventory (LSI) (Kolb, 1984, 1976). This research draws consistent learning profiles for men and women, respectively, across a number of gender-based learning studies that utilize it, showing that it is sensitive to gender (Brew, 2001). Though generally consistent, those gender learner studies using Kolb's LSI are relatively few in number.

The theory upon which Kolb's LSI is based is Kolb's Experiential Learning Theory (ELT) (Kolb, 1984). ELT is an adult form of learning predicated on the notion that learning comes from experience (McCabe, 2014). According to ELT, knowledge comes from the transformation of experience, which has two parts, referred to by Kolb (1976) as grasping and transforming. There are two opposing modes of grasping experience, Concrete Experience or feeling (CE) and Abstract Conceptualization (AC) or thinking, and two opposing modes of transforming experience, Reflective Observation (RO) or watching, and Active Experimentation (AE) or acting. These four modes have been portrayed by some (e.g., Garland & Martin, 2005; Orthun, 2007) as distinct activities that follow each other in a sequence that executes the learning process: feeling (CE), watching (RO), thinking (AC), and acting (AE). This sequence comprises a cycle or spiral that is continuously recurring as the next experience is encountered, and is directed by individual needs and goals (Joy & Kolb, 2009). Learners select what it is they choose to learn, in other words.

Different learning styles arise from the notion that individuals prefer to learn in different ways, i.e., each individual has a preference for one or more of the four learning modes over others, which is measured by the LSI. By extension, individual learners can be grouped according to similarity of learning style, as may be the case with female and male learners. For example, prior research indicates that male learners prefer Abstract Conceptualization (thinking) (Kolb, 1976, 1984; Leathwood, 2006). This has been shown for distance learners using Blackboard (Garland & Martin, 2005), for undergraduate arts and science students at an Australian university (Wilcoxson & Prosser, 1996), and for freshman undergraduates at a private university in the northeastern US (McCabe, 2014). Female learners prefer Concrete Experimentation (feeling) (Kolb, 1976, 1984; Leathwood, 2006). This has been shown for undergraduate arts and science students at an Australian university (Wilcoxson & Prosser, 1996), and for first year undergraduates in a general psychology course at Stockholm University (Heffler, 2010).

Further research has shown that male learners prefer AC over CE, whereas, female learners prefer the converse, CE over AC. This has been shown for non-students from seven countries who ranged in age and educational level (Joy & Kolb, 2009), for undergraduate arts and science students at an Australian university (Wilcoxson & Prosser, 1996), for students enrolled at Penn State Berks (Kulturel-Konak, D'Allegro, & Dickinson, 2011), for 5th semester mathematics students at Anadolu University in Turkey (Orthun, 2007), for first year undergraduates in a general psychology course at Stockholm University (Heffler, 2010), and for freshman undergraduates at a private university in the Northeastern US (McCabe, 2014).

A more recent study based on Kolb's LSI found that male undergraduate business students show themselves to be Abstract

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