Gender and Technology

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INTRODUCTION

Technology is widely used throughout society and in particular education. The growth in online courses and use of mobile devices has led to an increased use and dependence on technology. As more people embrace the use of technology to find information, communicate and conduct business there is a marked difference by gender in the use and adoption of technology. The gender difference in the use and adoption of technology is limited to not only academia but also employment. A digital divide still exists with technology and it includes gender as well as income. Gender also impacts end-user computing and in particular the confidence a user has to complete a task. Many of the studies focus on gender roles and self-efficacy in the use of technology. One aspect of gender differences toward technology is how women perceive the use of technology. Women focus on technology as a tool as opposed to men who focus on technology as a toy (Kelan, 2007). A few of the studies used the Technology Acceptance Model or the Unified Theory for the Acceptance and Use of Technology to examine gender differences in the use of technology. The Pew Internet & American Life Project examines digital differences based on gender, age, race/ethnicity, household income and educational attainment. (Zickuhr & Smith, 2012) Examining the literature about gender and technology it overwhelmingly indicates there are substantial differences in how men and women use technology. These differences show up in the classroom and work place. Gender bias exists in a number of different areas and it is very pronounced in the use and adoption of technology. Computer games are designed to appeal to males.

BACKGROUND

For the purposes of this article, technology is broadly defined as computer hardware and software, email, mobile technologies such as smartphones, tablets, laptops or netbooks. It will also include educational software including but not limited to course management systems, email, electronic resources and e-books. A literature review of indicates while women are making strides in the adoption and acceptance of technology they still are not at the same levels as their male counterparts. The literature review also indicates gender impacts women's attitudes toward technology and their confidence in using technology. The results from early studies indicated males felt more confident with technology as opposed to females who felt they were not proficient using technology. Ongoing studies focus on the gender differences in the use and adoption of technology with the studies indicating that males feel they have greater proficiency and ability when using technology versus females who feel they lack the confidence and proficiency to use technology.

A literature review reveals a number of studies focusing on student and employee use of technology based on gender or gender and age. A limited study on the gender differences in the adoption of an SMS based mobile library search system indicated male students did not see the perceived usefulness of the system while female students did not see the effectiveness of the SMS library search system (Goh, 2011). An early study from 2003 noted gender and age differences of employees' decisions to use new technology (Morris, Venkatesh, & Ackerman, 2005). A study of 211 students conducted at a university in Hong Kong indicated male students had more confidence using technology for

learning than female students (Yau & Cheng, 2012). Another study of collaborative Web 2.0 applications for learning in higher education yielded similar results (Huang, Hood, Yoo, 2013). A 2010 study examined if men were more technology oriented than women were (He & Freeman, 2010). A recent Pew Research study provides information on the adoption and use of technology based on age, gender and ethnicity. The majority of the research indicates women are not early adopters of new technology. Using previous and more recent studies will provide educators and employers the opportunity to use the study findings when promoting, training or designing new technology for use in the classroom or workplace.

Issues, Controversies, Problems

Technology is widely used in today's society. We are connected through email, mobile phones, social media, course management systems, laptops and tablets. Today's technology is integrated into almost all facets of society. Unfortunately, not everyone has the same level of proficiency using or adopting technology. Gender plays a significant role in how proficient users are with technology. Gender stereotypes are one reason why women lack self-efficacy in using technology. One of the earliest studies with college students found that females used email more than males and males searched the web more than women. More importantly the results indicated women had less confidence and more anxiety using computers (Jackson, Ervin, Gardner, & Schmitt, 2001).

One of the earliest and widely cited studies was undertaken by Venkatesh and Morris was published in 2000. This study on the criteria of gender and social influence and their role in the acceptance and use of technology. The study took place over a five month period with 342 workers who were being introduced to a new software system at their company (Venkatesh & Morris, 2000). This study compared the acceptance and usage of the software between men and women based on their perceived usefulness of the technology (Venkatesh & Morris, 2000). The results of this study indicated that men considered perceived usefulness to be more important than perceived ease of use. Women, on the other hand, considered perceived ease of use more important for technology. Perceived ease of use was never considered as an important factor by men

for technology (Venkatesh & Morris, 2000). At the time of their study Venkatesh and Morris noted that future studies should examine the influence of age, education, income, frequency of use and occupation (Venkatesh & Morris, 2000).

According to a 2006 study women spend less time online than men and have a lower self-assessment of their online abilities (Hargittai & Shafer, 2006). This study found that men of all ages spent more time online than women but women spent more time corresponding with their friends through email. Another finding from this study was not one woman considered herself to have 'expert' computer skills and none of the men considered themselves to be a novice or unskilled computer user (Hargittai & Shafer, 2006).

The same issue applies to gender differences in the use of technology in education. Several studies focused on how students use and adopt technology for their courses.

In a study conducted by Terzis and Economides they examined the gender differences in perception and acceptance of a computer based assessment. The study was conducted with students in a first-year undergraduate class from the Department of Economics at a Greek University with a sample size of 173 students consisting of 56 males and 117 females (Terzis & Economides, 2011). The authors of the study learned that factors such as playfulness, usefulness, content, and social influence males and female students differently. This study indicated male students were influenced to use the computer based assessment through playfulness, content and social influence as opposed to the female students who were influenced to use the computer based assessment through, playfulness, ease of use, content, and goal expectations (Terzis & Economides, 2011). Similar studies also noted the difference between male and female students' adoption and use of technology.

A 2010 study that focused on user acceptance of mobile Internet access used the Unified Theory of Acceptance and Use of Technology Model (UTAUT) to determine if there were gender differences in mobile Internet use (Wang & Wang, 2010). This theory uses the criteria of performance expectancy, effort expectancy, social influence and facilitating conditions that predict user behavior intentions and actual user behaviors in users adopting information technology for work-related purposes (Huang, Hood & Yoo 2013). The study confirmed the findings of Venkatesh, et al.

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