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First Generation College Students and Mobile Device Acceptance in Nursing Education

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Abstract: The National League for Nursing (2009) states that nurse educators must commit to diversity in education by reviewing practices that favor and exclude students. First generation college students (FGCS) have a background that may hinder success and require support to overcome barriers in a nursing program including mobile device acceptance. A cross-sectional survey of 37 students showed significant differences; FGCS have higher results than non-FGCS in six of the eight key constructs of mobile device acceptance. Mobile devices may help bridge the digital divide. By increasing emphasis on mobile device functioning in the nursing curriculum, nurse educators can continue to promote diversity.

INTRODUCTION

According to the National League for Nursing (2009), nurse educators must be committed to diversity in nursing education by examining and assessing practices that may favor some and exclude others. First generation college students (FGCS) are those who have a background that may hinder success and may need extra support to overcome barriers in a nursing program. FGCS are those whom neither parent received a Bachelor's Degree. Currently, educational practice is beginning to incorporate mobile devices into the nursing curriculum. Mobile devices are highly portable electronic devices, i.e. smart phones or tablets that can access the internet. Mobile devices can enhance how students learn nursing content (Airth-Kindree & Vandembark, 2014; Wu, 2014) and improve how nurses practice safe patient care (Pemmasani, Paget, van Woerden, Minamareddy, & Siri, 2014; Wray, 2013). In contrast, many higher education professors discourage or ban mobile devices in the classroom because of the distraction that the devices bring to the learning process (Dahlstrom & Bichsel, 2014). Even practitioners are concerned with the distractions that mobile devices bring to the clinical setting (McBride, 2015). However, the advent of mobile devices in nursing education has benefited the students by increasing the sources for evidence-based practice contributing to stronger patient centered care, thus providing more evidence to incorporate devices into this setting (O'Connor & Andrews, 2015; Raman, 2015).

With the emphasis of incorporating mobile devices into the nursing curriculum, some students may be at a disadvantage. Some nursing students may be excluded from using mobile devices due to the cost of owning a device (Cibulka & Crane-Wider, 2011; Wittmann-Price, Kennedy, & Godwin, 2012). Also, not all students are technology literate (Kowalski & Smith, 2012; Lai & Wu, 2012). The digital divide is the disparity of technology in regard to access, use, and knowledge based on certain demographic characteristics. The research question is "Are there differences among FGCS versus non-FGCS in regard to the educational practice of incorporating mobile devices into the nursing curriculum?"

To our knowledge, no current studies focused on mobile devices in higher education and FGCS. Many studies focused on other barriers of FGCS. Some of these students may have attended high schools that did not adequately prepare them for college (Contreras, 2012). They may need to take remedial courses during college; they are working more hours to pay for college, attending college part-time, and/or commuting to college (Contreras, 2012; Dumais, Rizzuto, Cleary, & Dowden, 2013; Stephens, Fryberg, Markus, Johnson, & Covarrubias, 2012; Wilson & Kittleson, 2013). For example, non-FGCS are twice as likely to complete calculus or pre-calculus in high school than FGCS, which is a major factor on test scores for college (Contreras, 2012). If FGCS attend college, the underlying values and norms of independence propose a barrier for academic success because their cultural norm may be one of interdependence (Stephens et al., 2012). FGCS have a harder time adjusting to college (Hertel, 2010). Because FGCS are the first to obtain a degree in their family, they also may lack the social support systems at home

that encourage, promote, and support attending college and finishing a degree (Contreras, 2012; Wang, 2012; Wilson & Kittleson, 2013). FGCS tend to be African-American or Hispanic and come from low socio-economic backgrounds (Contreras, 2012; Hertel, 2010). However, FGCS are also optimistic about the future with hope of climbing the social ladder and are persistent in overcoming obstacles in their education (Contreras, 2012; Dumais et al., 2013; Wang, 2012; Wilson & Kittleson, 2013). Despite this optimism, Vuong, Brown-Welty, and Tracz (2010) found that FGCS have lower college self-efficacy affecting academic success and less persistence than non-FGCS. FGCS face many barriers that impact academic success.

To our knowledge, there were no nursing studies focused on mobile devices and FGCS. The current study is a pilot to examine the proposed Mobile Device Acceptance (MDA) theoretical framework among nursing students and their educational experiences of MDA in the classroom, lab, and clinical settings. Because the cost of the device and technology literacy may be obstacles for FGCS, as well as the unique characteristics of this group, this study will hypothesize that there will be a difference in MDA among its subscales between FGCS versus non-FGCS.

CONCEPTUAL FRAMEWORK

This study's framework incorporates the Technology Acceptance Model (TAM) (Davis, 1989) and Self-Efficacy (SE) (Bandura, 1997) in examining MDA. The TAM model has been tested in a variety of disciplines with different types of technology. Chow et al. (2013) tested the TAM in nursing education with electronic imagery software. Kowitlawakul, Chan, Pulcini, and Wang (2014) tested the TAM using an electronic health record with simulation patients.

Based on TAM and SE, there were eight constructs that influence overall Mobile Device Acceptance. The end construct is Behavior Intention, which is the desire to use mobile devices to enhance nursing education. Perceived Usefulness is the students' beliefs that mobile devices actually can assist in enhancing nursing education. Attitudes toward MDA are the feelings students possess about using a mobile device for nursing education. Perceived Ease of Use is the effortless incorporation of mobile devices for nursing education. Each of these constructs has a direct impact on Behavior Intention. Mobile Device Self-Efficacy is the students' beliefs in their own capabilities in using a mobile device for nursing education, which has an indirect and potential direct impact with Behavior Intention. The following constructs are sources of SE which include Past Accomplishment (defined as the successful use of mobile devices in prior experiences to enhance nursing education), Vicarious Experiences (defined as modeling from others on the use of mobile devices) and Social Persuasion (defined as the voiced influences that support using mobile devices for nursing education).

STUDY INSTRUMENT

The 52 items of the mobile device acceptance (MDA) scale measure the strength of the participants' self-reported perceptions of mobile devices and consist of eight subscales (Perceived Usefulness, Perceived Ease of Use, Attitude, Behavior Intention, Mobile Device Self-Efficacy, Past Accomplishment, Vicarious Experiences, and Social Persuasion). The scale used a five-point Likert scale, ranging from 1-Strongly Disagree to 5-Strongly Agree. A sample item measuring Perceived Usefulness is "A mobile device can improve my learning efficiency for nursing school," and for Behavior Intention, "I would become too dependent on a mobile device if I used it for nursing curriculum" (reverse order). The study instrument had a good-to-excellent reliability except the Vicarious Experience subscale (Cronbach's $\alpha=.71$), whereas the Cronbach's alpha of the overall MDA scale was 0.96 and alphas' range from 0.75-0.92 for seven subscales. This approach measures the degree to which the test items represent the domain or universe of the trait or property being measured. In order to establish the content validity of the MDA scale, a panel of content experts, one in nursing education and two with mobile devices, were asked to examine the content of scale items. In addition, eight nursing students examined the items and provided input on item clarity and appropriateness.

DESIGN AND SAMPLE

The university's institutional review board reviewed the study protocol and granted approval for the study. The study sample consisted of 37 Junior and Senior-level pre-licensure BSN nursing students at a Mid-western

university where mobile devices are not mandatory for the curriculum. They completed an electronic survey, with a 33% response rate. The sample consisted of: 87% female students, 17% minority students, and the average age of 28 years. Only two of these students did not own a mobile device. 76% of the sample owned two or more mobile devices. Twenty nursing students self-identified themselves as FGCS.

RESULTS

An independent t-test was conducted to see the difference in MDA between FGCS and non-FGCS. The results showed that in six of eight subscales, there were significant differences with FGCS having higher levels in Perceived Usefulness ($M=4.36$ vs. M of non-FGCS= 3.54), Perceived Ease of Use ($M=3.96$ vs. M of non-FGCS= 3.54), Behavior Intention ($M=3.94$ vs. M of non-FGCS= 3.41), more positive Attitudes ($M=4.37$ vs. M of non-FGCS = 3.36) and higher Mobile Device Self-Efficacy ($M= 4.48$ vs. M of non-FGCS= 3.74), and higher levels of Social Persuasion($M=3.36$ vs. M of non-FGCS= 2.83), with all the statistical significance at $p<.05$ level.

CONCLUSION

FGCS had a significantly higher MDA score than non-FGCS. Mobile devices may bridge the digital divide. Although cost of a device was a barrier in previous nursing research, current ownership of a mobile device in the young adult age bracket is 97% (Fox & Rainie, 2014). On further research in other disciplines with technology literacy, it was found that the African-American and Hispanic population, which has the propensity to be considered FGCS, uses more smartphone functions, such as online banking, social networking, and health related apps, significantly higher than Caucasians (Kratzke & Cox, 2012; Smith & Zickuhr, 2012).

Because there are no other studies on mobile device use and FGCS in nursing or other disciplines, results from current study has implications in nursing education. FGCS will benefit from the use of mobile devices. Mobile devices help support FGCS in their learning and academic success. According to Swenty and Titzer (2014), there is an urgency in Master's Degree Nursing programs to use mobile devices in the curriculum. This same urgency must happen in pre-licensure programs. There is not only the benefit of increased evidence based practice with safer patient outcomes (O'Connor & Andrews, 2015; Raman, 2015), but supporting diverse nursing students must also occur. These results can inform nursing educators to incorporate mobile devices into the nursing curriculum, especially as some educators are reluctant to embrace this practice (Raman, 2015). Educators may attend workshops on mobile device use as an educational tool and not as a distraction in the learning environment or a violation of patient confidentiality in the clinical sites. Educators may appreciate the advantages of nursing students using mobile devices for clinical rotations, to allow all nursing students the use of mobile devices on the clinical floor (Raman, 2015). Educators, students, and clinical sites can implement best standard practices of mobile device use. Specifically, course activities using mobile devices for increased learning must occur. Raman (2015) recommends using faculty who are "super users" of mobile devices to model to their peers how to incorporate mobile devices into the nursing curriculum. Web sites and course management systems must have a mobile device version with content easily seen and manipulated. These specific outcomes will not only aid in student learning, but also support FGCS.

The limitations of this study included a small sample size, self-report questionnaire, the need for further psychometric testing of the instrument, and one setting that limited generalization. MDA does not present a barrier for FGCS. However, nurse educators can support FGCS by the continued use and promotion of the devices to enhance the nursing curriculum. Because the NLN (2009) advocates for flexible, open, and inclusive environments, universities that do not require mandatory mobile devices for the nursing curriculum must continue to use mobile devices in the pedagogical approach. With the increased emphasis on mobile devices through expansion of functioning in the nursing curriculum and health care practice, nurse educators can continue to propitiate diversity.

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