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Intention to Utilize Mobile Game-Based Learning in Nursing Education from Teachers' Perspective: A Theory of Planned Behavior Approach

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Abstract - When faced with a pandemic such as coronavirus disease 2019 (COVID-19), many educational institutions are scrambling to find methods to enhance their present processes and prepare for the difficulties of this worldwide danger.. It's not apparent whether nursing professors are ready to employ ICTs like video games to lessen the bad impacts of the epidemic, despite advice from experts. To find out more about nursing instructors' behavioural purpose to use mobile game-based learning (MGBL) and its connection to key elements of the Theory of Planned Behavior, this research was conducted" (i.e., perceived behavioural control, subjective norms, and attitude). Most of the nursing instructors were female, a master's degree holder, with an academic rank of instructor, not a certified professional teacher, and a permanent and full-time employee at private institutions in the Visayas area of the Philippines, according to descriptive data. As a result, they have little knowledge about MGBL or mobile games in general. As a final note, we found that characteristics associated with Theory of Planned Behavior were positively connected with nursing educators' plans to use MGBL. Predicting whether or not nursing instructors would use MGBL in the classroom is the subject of future

research, which builds on the work done here by exploring the potential benefits of MGBL in nursing education.

Keywords: Theory of Planned Behavior, Nursing Education, Game-Based Learning, Mobile Learning Games.

I. Introduction

When the COVID-19 epidemic unexpectedly arrived, nursing education had to undergo a major adjustment (Gaffney et al., 2021). Many educational institutions have shifted from conventional face-to-face to virtual teaching and learning settings in order to comply with rules and recommendations published by the World Health Organization (WHO) and government organisations (Agu et al., 2021). Fortunately, the research shows that online education is well-accepted and well-liked among nursing students (Ali, 2016; Garcia, 2017; McCutcheon et al., 2015). Additional evidence of lecturers' readiness for online classes during pandemics (Cutri et al., 2020; Junus and colleagues, 2021) suggests that this "readiness" is complex and requires a contextual perspective (Scherer et al., 2021). Students in nursing programmes, on the other hand, may find taking classes entirely online during the pandemic to be a very stressful and time-consuming experience (Langegrd et al., 2021), as it limits their social interactions and can have a negative impact on their mental health (Rosenthal et al., 2021). (Oducado & Estoque, 2021). Agu et al., 2021) urge that health officials and nursing regulatory organisations put rules in place, but it is also advised that nursing instructors assist students who are having difficulty with online learning due to a lack of interest, motivation, or technical challenges (Gaffney et al., 2021).

Integration of ICT into the curriculum has been advocated as a means of decreasing the obstacles of teaching and learning during and sparked by the COVID-19 epidemic (Ukata & Onuekwa, 2020). In particular, digital game-based learning has resurfaced in the literature as an additional instrument for emergency online education as a technology modality (Ika Febriana & Yuniawatika, 2020; Park & Kim, 2021; Toquero et al., 2021). Before the pandemic, attracting the attention of nursing students was difficult since they preferred active teaching methods like as gaming (Snoek and colleagues, 2018). (McEnroe-Petitte & Farris, 2020). Nurse educators, on the other hand, have been more sluggish in adopting new teaching approaches and still rely on the lecture as their primary style of instruction (Lee et al., 2019). There is a possibility for nursing instructors to use gaming in emergency online education, as a comprehensive literature review concluded that the implementation of gaming in undergraduate nursing education led to good student comments, improved test scores and greater knowledge (Reed, 2020). Nurses may be reluctant to employ gaming in the face of this global health catastrophe, though. Nursing instructors' behavioural intention to include MGBL and the link between its fundamental elements, such as perceived behavioural control and attitude, subjective norms, were examined in this research. There were also additional details on the profile of nursing instructors with regard to the sort of institution they worked for and the type of licence they had in professional education as well as the amount of time they spent playing games on MGBL each day. Research from this study might aid academic institutions in developing plans for enticing nursing professors to include MGBL into their lectures, whether they do so live or virtually at the 1st Conference on Online Teaching for Mobile Education (OT4ME!) in 2021. Mobile gaming-based learning (MGBL) was chosen over computer game-based learning because it provides more learning possibilities than the latter (OC&C Strategy Consultants, 2020). (Garcia & Mangaba,

2017). MGBL in nursing education is being explored in this research, and a subsequent study will focus on the prediction of instructors' intentions to employ MGBL in their classrooms.

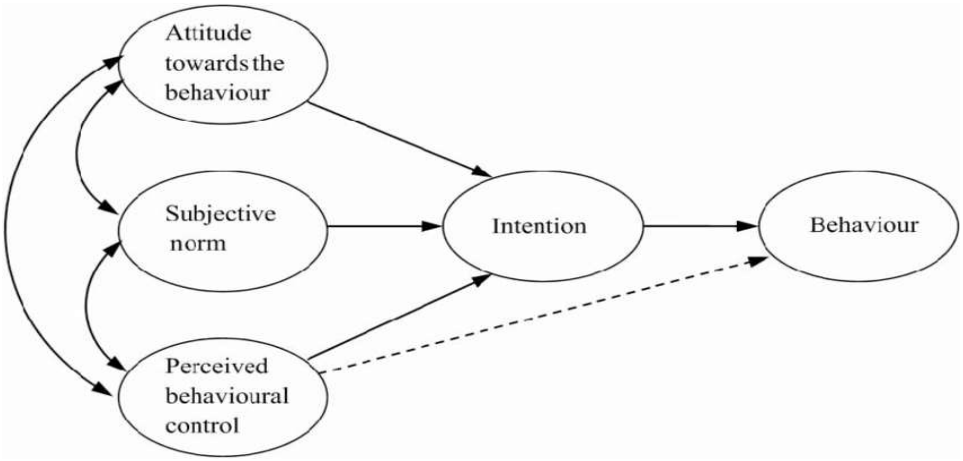

Figure 1: Theory of Planned Behavior

II. Background Of The Study

A *The Theory of Planned Behavior*

Psychological theories such as the Theory of Planned Conduct might be used by knowledge explorers seeking to understand the connection between beliefs and behaviour in order to assess nursing instructors' purpose to use MGBL. According to the Theory of Planned Behavior, the more strongly you intend to carry out a certain action, the more likely it is that you will follow through (Ajzen, 1991). Commitment to action is influenced by a variety of elements, such as personal standards, mindset, and a sense of behavioural control (see Figure 1). To better explain a range of actions (e.g., nursing students' purpose to seek clinical experiences, Meyer, 2002; Ben Natan et al., 2017); report medication mistakes, Gagnon et al., 2015; follow suggestions, and attend lectures), social psychologists created this theory (Skoglund et al., 2020). As a matter of fact, it is the most often utilised socio-cognitive theory for predicting healthcare workers' behaviour, and studies based on it had much superior predictive power than those that employed other theories (Godin et al., 2008). The Theory of Planned Behavior (TPB) was used as the psychological model for this research in order to assess the intention of the nursing instructors to use MGBL in the classroom.

B *Technology-Based Nursing Education*

Numerous studies have examined the importance of technology integration in classrooms and the efficient use of educational technology by instructors. There are seven distinct categories of learning environments and technologies identified in a systematic assessment of the literature, such as "adaptive" and "analytical" learning, "mobile" learning, "social media," "massive open online courses," "special education technology," and "game-based" learning (Martin et al., 2020). 'Digital native generation' necessitates that nurse educators include new teaching and learning modalities into their classes as a result of advances in technology. As an example, high-fidelity simulations may be included to case scenarios (Ali, 2016), podcasts can be used as a supplement for instructional materials (O'Connor et al., 2020), and many more (Martin et al., 2020).

Although they recognise its potential as a distraction, nursing students generally see technology as beneficial and simple to use (Williamson & Muckle, 2018). Practicing nurses have a good view of the use of technology since it improves care practises, makes it easier to collect data, and eliminates the waste of time and money that would otherwise be spent on it (Ozan & Duman, 2020). As a result, the use of technology-based teaching and learning methods in nursing education is embraced.

C *Mobile Game-Based Learning*

For the most part, researchers have focused on the impact that MGBL has on the emotional dimensions rather than the cognitive domains (32 out of 36, 88.19%, from 2004 to 2016). The positive impact of MGBL on students' attitudes, values, enjoyment, and motivation (McEnroe-Petitte and Farris, 2020) is still valuable, especially at a time when students are becoming more stressed (Oducado & Estoque; Rosenthal; et al., 2021) and having a negative impact on their mental health (Rosenthal et al., 2021). The use of mobile and computer-based games in healthcare is nothing new. Although these games may take various forms, some of the most popular are fooya! (Kato-Lin et al. 2020) and Theraphasia (Garcia, 2019), which uses implicit learning processes to help children acquire healthy eating habits. Despite this, the use of MGBL in nursing education is not as well accepted as it should be. There is a dearth of nursing-themed mobile games in academic journals, conference papers, and dissertations apart from commercial games available for download from app stores (see Figure 2). Research in this field is needed to generate evidence-based and verified MGBL mobile learning games. There can be no doubt that MGBL plays an important function as an educational tool, given that a thorough literature review found that introducing gaming into undergraduate nursing education resulted in favourable student comments, improved test scores, and enhanced knowledge (Reed, 2020).

Figure 2: Examples of Casual and Educational Mobile Games for Nursing Education: Hospital Dash, a simulator clicker game for mastering time management as a busy nurse; Rookie Nurse, a fun nursery game where players are responsible for taking care of all the newborns; Nursing Sim, an educational mobile game to practice the multifactor decision-making process of nurse assignment; Operate Now: Hospital, a simulation game to perform realistic surgeries on patients.

III. Methodology

A *Study Design*

correlational studies were undertaken to examine the use of MGBL by nurses and the influence of characteristics such as subjective norms, perceived behavioural control, and attitude on their desire to use it. An example of an observational study design, a cross-sectional study examines both the exposure and the result simultaneously. Cross-sectional and correlational research designs may be combined when the phenomena to be researched are quantitative (as in this study) (Zangirolami-Raimundo et al., 2018). In addition, this study used a questionnaire prepared by the researchers to gather data from the participants. This questionnaire's content was derived from the Theory of Planned Behavior's fundamental elements. This work serves as an introduction to MGBL in nursing education, and a follow-up study will look at characteristics that predict MGBL in nursing students.

B *Sample and Sampling Technique*

During the period of data collection, the study's sample comprised of nursing professors who were presently working as faculty members at any Philippine higher education institution. Purposive and snowball sampling were employed in the research to choose and enrol individuals. As a first step, a purposive sampling strategy was used to guarantee that the initial group of respondents, namely, nursing instructors, was picked. A second method of increasing the sample size was snowball sampling.

C *Research Instrument*

Two sections of the questionnaire were utilised in the research. According to this first section's findings (e.g. sex orientation, academic rank, job schedule), the second section gathered information such as MGBL experience and daily playtime time. The second section of the study focused on the respondents' attitudes, perceptions of behavioural control, subjective norms, and behavioural intention with respect to MGBL. Using Cronbach's analysis, the reliability of the second section of the questionnaire was verified on a small sample of responders. We can say with confidence that the = 0.911 for the five items of attitude, 0.967 for the five items of subjective norms and 0.959 for the seven items of behavioural control were all accurate.

D *Data Collection and Analysis*

An online survey was utilised to gather data for this research in July 2021 because of the pandemic constraints. The link to the poll was posted on the authors' social media profiles and forwarded to the deans and faculty members of several nursing institutions for dissemination. Additionally, respondents had the option of forwarding a link to their colleagues and co-workers. On the first page of the poll, specifics about the investigation were offered. In order to start with the survey, nursing instructors had to provide their permission to participate in the research. All data obtained throughout the research was kept private and confidential at all times. Frequency counts, percentages, Cronbach's alpha analysis, one-way chi-square, and Spearman rank-order correlation coefficient were all used to analyse the data.

IV. Results And Discussion

To find out whether nursing instructors want to employ MGBL and if there is a connection between MGBL's key components, such as perceived behavioural control and attitude, as well as its subjective standards, this research set out to find out. As a result, it collected data on

everything from the gender and age of nursing instructors to their job titles and educational backgrounds to the sort of institution they work at and their licence status to their daily playtime time and their MGBL experience.

Table 1: Demographics Profile Distribution

Age (years) Mean = 52.98	**Frequency**	**Percentage**
20 – 40	70	20.0
41 – 60	180	50.0
61 – 80	104	28.9
> 80	4	1.1
Total	**360**	**100**
Sex		
Male	311	86.4
Female	49	13.6
Total	**360**	**100**
Level of Education	**Mean = 8.38**	
No Formal Education	61	17.0
Primary	116	32.2
Secondary	108	30.0
Tertiary	75	20.8
Total	**360**	**100**
Household size	**Mean =7**	
1 – 5	119	33.0
6 – 10	172	47.8
11 – 15	59	16.4
> 15	10	2.8

A *Profile of the Respondents*

Table 1 shows the demographics of those who took the survey. The online survey was completed by 76 nursing educators. The respondents' average age was 41.28 years old, and they had an average of 11.14 years of teaching experience. Women (n = 51, 67.1 percent), master's degree holders (n = 44, 57.9 percent), instructors at private higher education institutions (n = 54, 71.1 percent), and full-time faculty members (n = 62, 81.6 percent) were found in the Visayas region of the Philippines (n = 55, 72.4 percent). The majority of faculty members were not licenced professional teachers (n = 44, 57.9 percent). More than half of the nursing instructors (n = 40; 52.6 percent) do not play mobile games on a regular basis, and most had never heard of MGBL (n = 56; 73.7 percent).

Because there were more women than men among the survey respondents, a one-way chi-square analysis revealed a significant gender imbalance (2 = 8.895, DF = 2, p = 0.003). Not surprisingly, the nursing profession and education are dominated by women (Oducado, 2019). Most nursing instructors had a master's degree (2 = 20.711, DF = 2, p = 0.000) and the maximum educational attainment of respondents was not evenly distributed. To teach at the university level, a master's degree is required. Despite the fact that the majority of instructors are not certified professional teachers (2 = 1.895, DF = 2, p =.169), the respondents were evenly split on the issue of licencing. Teaching at the university level does not need a professional teaching licence; however, teaching nursing courses at the undergraduate level does require a licence as a nurse. Most instructors had never used MGBL in the classroom (2 = 17.053; DF = 2; p =.000); but, respondents were not evenly split in terms of how much they have used it. According to Lee

et al. (2019), former academics, most nursing instructors do not have a background in education and are accustomed to the conventional lecture discussion style.

Table 2: Correlation between Variables

Independent Variables	*r*	*p*-value
Subjective Norms	.617	.000
Attitude	.431	.000
Behavioral Control	.334	.003

Note: significant if < .05

B *Correlates of Behavioral Intention to Use MGBL*

Teachers in nursing seem to have a moderate to high intention to utilise MGBL, despite the fact that most of them do not play mobile games and have never used MGBL for educational reasons. Nursing instructors should benefit from being introduced to the concept of MGBL since it has been shown to be a good predictor of behaviour (Ajzen, 1991; Ditching et al., 2020). It has been established in Table 2 that there is a substantial, moderate association (r =.617) between subjective norms and intentions to use the product. Between the participants' attitudes about MGBL and their desire to utilise it, there was an important positive moderate association (r =.431, p = 000). There was a small but significant association (r =.334, p =.003) between attitude and intention to utilise MGBL when it came to perceived behavioural control. When individuals they care about support the use of MGBL, and they are optimistic about using MGBL, they are more likely to use MGBL than when they don't believe they are capable or in charge of using MGBL. Research on nursing educators' intentions to utilise MGBL is few, but evidence on the Theory of Planned Behavior's capacity to explain students' intentions to use mobile learning and play games on mobile devices has been consistent. In previous studies, attitudes, subjective norms, and behavioural control were shown to influence whether or not university students in the United States intended to play augmented reality mobile games (Koh et al., 2017). Using the Theory of Planned Behavior, a research in the United States found that college students' acceptance of mobile learning may be fairly well explained (Cheon et al., 2012). Furthermore, the three factors of the Theory of Planned Behavior (TPB) also had an impact on university students in Ghana's desire to use mobile learning (Tagoe & Abakah, 2014).

V. Conclusion

As part of the early examination of MGBL in nursing education, this study sought to assess the instructors' intentions to utilise MGBL and construct a picture of their personality. A majority of nursing instructors were female, with a master's degree, but not a certified professional teacher, a full-time employee of private higher education institutions, and a permanent and full-time employee. Despite the fact that they do not play mobile games and have never used MGBL for educational reasons, they nonetheless seem to have moderate to high intentions to do so. Attitude, subjective standards, and perceived behavioural control are all components of the Theory of Planned Behavior that might help explain why nursing professors choose to utilise MGBL in their classrooms. To boost the chance of MGBL acceptance, these elements may be used. Making a positive impression, altering one's outlook, and enhancing one's skill in using MGBL may be important to promote the use of MGBL in nursing education among instructors.'

Educators may also consider introducing MGBL to nursing instructors and giving them with training on its usefulness and usage.

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