

## **Perceptions of students and educators on the potential use of mobile devices in an undergraduate nursing module**

J.J. WILLEMSE<sup>1</sup>, K. JOOSTE<sup>1</sup> AND V. BOZALEK<sup>2</sup>

<sup>1</sup>*Faculty of Community & Health Sciences, School of Nursing, University of the Western Cape, Bellville, Cape Town, South Africa. E-mail: jjwillemse@uwc.ac.za*

<sup>2</sup>*Director of Teaching and Learning Office, University of the Western Cape, Bellville, Cape Town, South Africa*

### **Abstract**

Higher education is in the midst of an electronic transformative change cycle attributable to advancements in mobile technology. This transformative process took us from stationary desktop computers to laptop computers and currently to mobile technology. Mobile technology brings a new dimension to the traditional face-to-face method of teaching with the availability of online resources. This study explored the perceptions of nursing students and educators on the potential use of mobile devices in an undergraduate nursing programme at a Higher Education Institution in the Western Cape Province. A quantitative, explanatory, descriptive research design method was utilised through an electronic survey. The sample of respondents included eighty four (n=84) third year undergraduate nursing students registered for the Primary Health Care Module and six (n=6) educators involved in the facilitation of this module. An instrument was developed after a literature review had been conducted and face and content validity had been verified by experts in the field of emerging technology. The electronic survey was implemented by using Google Drive to investigate the respondents' perceptions on the use of mobile devices. The rationale for that approach was to gain a general picture about the extent of the respondents' knowledge with regard to the use of mobile devices to provide a foundation for developing a mobile learning intervention that would enhance students' integration of theory and clinical practice. The descriptive data analysis was done using the IBM Statistical Package for the Social Sciences (SPSS), Version 22. Data was analysed to obtain descriptive statistics and means and standard deviations were summarised. The analysis revealed the perceptions of students and educators in relation to their knowledge on the use of mobile devices, including their preparedness to use their mobile devices for enhancing the integration of theory and clinical practice of the Primary Health Care Module. The discussion of the findings is supported by literature that contextualises the results to guide further engagement with mobile devices. The necessary ethical clearance and permissions were obtained for the study and the researcher adhered to ethical principles before and during the implementation of the survey.

**Keywords:** Students, educators, mobile learning, mobile devices, undergraduate nursing programme.

### **How to cite this article:**

Willemse, J.J., Jooste, K. & Bozalek, V. (2014). Perceptions of students and educators on the potential use of mobile devices in an undergraduate nursing module. *African Journal for Physical, Health Education, Recreation and Dance*, October (Supplement 1:1), 179-196.

## **Introduction**

The practices of teaching and learning at Higher Education Institutions (HEIs) are experiencing challenges and fundamental changes in response to global technological and learning research trends (Siemens & Tittenberg, 2009). The modes of learning have evolved from being bound to physical classrooms to virtual learning experiences (Nordin, Embi & Yunus, 2010). Thus, with the availability of online resources that are supported by virtual learning environments, mobile technology brings a new dimension to the traditional face-to-face methods of teaching (Mason & Rennie, 2008; Gupta & Koo, 2010).

In clinical nursing practice courses, mobile learning has been used to bring instructors, peers, and resources together by means of mobile devices at the point-of-care to enhance students' safety and evidence-informed practice (Kenny, Van Neste-Kenny, Burton, Park & Qayyum, 2012). Park, Van Neste-Kenny, Burton and Kenny (2010) argue that mobile learning could also be effective in supporting the teaching and learning of nursing students, for example, students integrate theory in their practice. By using the appropriate emerging technology, fundamental changes in curriculum design and delivery at HEIs could provide students in the 21<sup>st</sup> century with an opportunity to enhance their learning (Bates & Sangra, 2011).

The Institutional Operating Plan (IOP) 2010 – 2014 of the Higher Education Institution (HEI) where the researcher was a lecturer set a goal that strives at ensuring the enhancement of teaching and learning. The identified objectives of this goal are to: enhance and promote the status of teaching and learning, infuse technology into teaching and learning and promote the use of e-pedagogy, develop an infrastructure for teaching and learning, develop a more responsive teaching and learning environment that promotes and enhances flexible learning to adequately address students' learning needs, improve retention and throughput of students, and ensure responsive teaching and learning programmes and practices. The use of mobile devices has the potential to not only address the IOP of the university, but it also has the possibility of bridging the gap in the continuum of learning for students while being on or off campus (Cook, Pachler & Bradley, 2008).

In 2010, a Higher Education Institution (HEI) in the Western Cape identified the need for research about the use of mobile devices in nursing education. At the HEI, the researcher facilitated a year level clinical feedback meeting where clinical facilitators voiced their concerns about their undergraduate nursing students who seemed unable to connect theory with their clinical practice. They mentioned that students were not inclined to carry with them into clinical practice the clinical module guides and textbooks essential to assisting them in

the achievement of their clinical outcomes. One of the reasons discussed was that undergraduate nursing students might find it challenging and sometimes impractical to “cart” clinical module guides and textbooks from an academic classroom or library environment to a “restricted” hospital or clinical environment with limited availability of space for research in a hygienically clean or sterile clinical setting. The meeting identified the need to find innovative ways, such as the introduction of mobile devices, that could assist students to address the problem of having resource material available at any time or at any given place to enable them to do research on conditions or procedures while off campus and in the clinical field (Cook *et al.*, 2008).

Since 2010, the researcher has observed students who are using different applications on their mobile devices for either social networking or Internet research. At the moment, mobile devices are not used to enhance learning at the School of Nursing, University of the Western Cape. This observation led the researcher to attend an emerging technology course in May and June 2012 offered by experts in mobile technology at HEIs in the Western Cape Province in order to broaden her knowledge on integrating emerging technologies, specifically mobile technology, in nursing programmes. Pachler, Bachmair and Cook (2010) view M-learning as a process of discovering how to use this technology successfully within an ever changing learning environment with the purpose of enhancing the learning process. During the emerging technology course, experts addressed and described their experiences about the application of mobile technologies at their respective HEIs.

## **Methodology**

### *Design of the study*

This quantitative study followed an explanatory descriptive design to collect data using Google Forms, a survey that is an application in a suite of applications in Google Drive. A survey is a quantitative research strategy where data collected can be analysed by applying descriptive and inferential statistics (Saunders, Lewis & Thornhill, 2009). Developing the survey in Google Drive was preferential, since it was a free and flexible service from Google that included word-processing and presentation components. It furthermore had the function of enabling multiple authors to work collaboratively on the same document in real time (Rowe, Bozalek & Frantz, 2013). This function was used during the review of the draft survey at a workshop held in Cape Town in March 2013.

### *Population and sample*

The accessible population was a total of one hundred and fourteen (n=114) students registered for the Primary Health Care Semester Module who completed the module in semester one of 2013 at the university where the study was conducted and the educators (n=6) who had facilitated the module. A total of eighty four (n=84) out of the one hundred and fourteen (n=114) students registered for this module volunteered to participate in the study. Sampling for this study involved the selection from an accessible population to participate in this study of which the purpose was to generate an understanding of the perceptions of students and educators about the use of mobile devices in an undergraduate nursing programme (De Vos, Strydom, Fouché & Delport, 2011). To be included in the study, the students and educators had to be in possession of a mobile device and they needed to be willing to use their personal mobile device as a tool in the study.

### *Data collection*

Based on a literature review, surveys (an electronic instrument) for students and educators respectively were developed in Google Forms component of Google Drive. The purpose of the literature review was to provide a background on the affordances of and the pedagogical and instructional models for mobile technology in an educational environment. The student survey had 24 questions while the educators' survey had 28 questions. In both surveys, Section A and Section B had similar questions but in Section C and Section D the questions became more specific to students and educators, since the questions aimed at getting a desired response. An open-ended question was formulated for additional comments, and the responses were simply used to explain some of the responses on items. Relevant responses were extracted from all the survey responses to view the perceptions of the students and educators on the use of mobile devices in the Primary Health Care Module of an undergraduate nursing programme. It was important to establish the extent of their knowledge about mobile devices.

Some of the questions required a simplified Yes / No response while others had a five-point Likert scale with structured questions to which respondents had to indicate the extent to which they disagreed or agreed with a given statement (ranging from 1=never to 5=always). Likert or summated rating scales are self-reported data collection instruments where participants numerically respond to an expressed question based on their perceptions (De Vos *et al.*, 2011). Some closed-ended questions were included in the instrument.

### *Pretesting of the instrument*

The pretesting of the instrument was done with third year undergraduate nursing students ( $n=10$ ). Minor corrections were identified by students while completing the survey. The pretesting of the instruments also served its purpose of checking whether the respondents would have any difficulty answering the questions (Saunders *et al.*, 2009). The identified corrections were done before the implementation of the survey. The survey was distributed electronically and it was completed by the educators ( $n=6$ ) and a total of 84 students out of the 114 students registered for the semester module. The survey was distributed using the Google Gmail addresses of both groups. The respondents who took part in the pretesting of the instrument were not included in the main study.

### *Ethical considerations*

Ethical approval for this study was obtained from the Senate Higher Degrees Committee of the Faculty of the Community Health and Sciences (Registration Number 12/10/16), and from the Registrar and the Director of the School of Nursing at the HEI where the study was conducted. Written, informed consent was obtained from respondents prior to their involvement in the research project, after the purpose of the study and the expectations of the researcher were explained. Respondents were informed that they could withdraw from the study at any stage of the research process without any consequences or implications to their studies.

Respondents gave consent to have the number of their mobile phone made available to the researcher. The researcher had the responsibility to ensure that data collected during the study would be available to no person other than the researcher, researcher supervisors, and the statistician. Confidentiality and anonymity of all data related to the study respondents were assured by using coding techniques on the completed electronic surveys and the data would be kept in a safe place under lock and key for a 5-year period after the results have been published in an accredited journal.

### *Preparation of the field*

Venues were booked on campus for the completion of the survey and respondents were given the option to complete the survey on or off campus. An information leaflet and a permission form were handed out at the venue where all students were present. An explanation was given to clarify the research topic and to explain the purpose of the research project before respondents were allowed to open and complete the online survey. The electronic survey took less than the 30 minutes of the allocated time to complete.

### *Validity and reliability*

The validity of the instrument was ensured by pretesting of the instrument by three experts in the field of emerging technologies after it had been developed based an extensive literature review. The experts were able to provide guidance on certain questions that had to be included in the survey with the purpose of receiving the expected outcome. The instrument was pretested for face and content validity. The reliability of the instrument was enhanced by ensuring that the questions were relevant to the respondents in the study. Coefficient alpha is an index of internal consistency that estimates the extent to which the different items of an instrument are reliably measuring the critical attribute (Polit & Beck, 2012). Cronbach's alpha coefficient of reliability, an alpha of 0.7, is normally considered to indicate the reliability of a data set (De Vos *et al.*, 2011).

### *Data analysis*

The data was statistically analysed by an independent HEI statistician. The IBM Statistical Package for the Social Sciences (SPSS), Version 22 was used to conduct the descriptive data analysis. Data (frequencies, mean values, and standard deviations) are presented in statistical charts and tables, since this allows analysed data to be presented in a manner that is easy to understand (Watson, McKenna, Cowman & Keady, 2008).

## **Results**

The results of the demographic characteristics of the study illustrated that 66 of the respondents from the third year undergraduate nursing students registered for the Primary Health Care Module, were female (78.6%) and 18 were male (21.4%) ( $n=84$ ). The nursing profession has historically been dominated by females, hence more female than male students participated in the study. Six educators who facilitated the Primary Health Care Module completed the survey of whom four were female and two were male ( $n=6$ ).

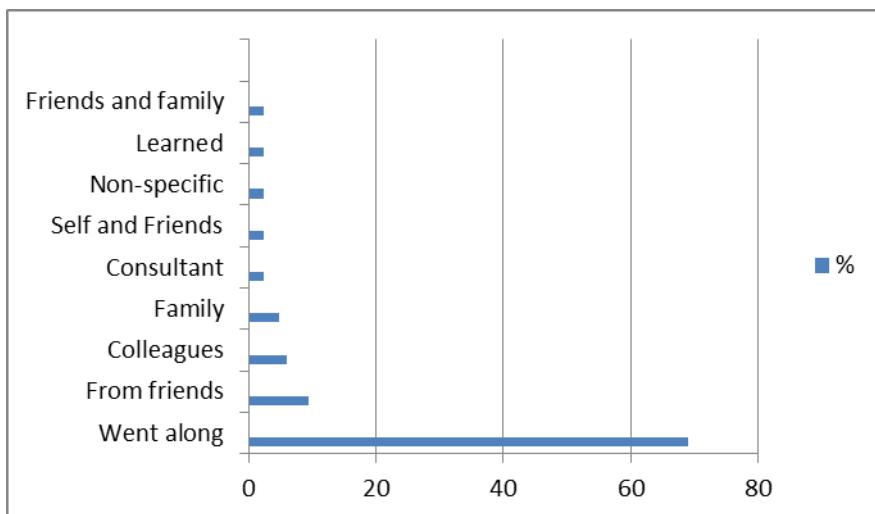
Three students (3.6%) started using a mobile device six months ago or less, four students (4.8%) one year, 10 students (11.9%) two to three years, and 67 students (79.8%) more than three years.

It is important that the majority of the student respondents (67, 79.8%), were using mobile devices for more than three years at the time of the survey and the assumption was that students should know exactly how to effectively use their personal mobile devices and they would thus not be disadvantaged during the implementation of a mobile learning strategy. At the time of the survey, two educators indicated that they started using a mobile device about a year before

and four educators started using a mobile device more than three years ago (n=6).

*Learned to use mobile devices (n=84)*

Fifty eight students (69%) indicated that they learned to use their mobile devices as they went along, eight students (9.5%) learned from friends, five students (6%) learned from colleagues / peers on campus, four students (4.8%) learned from family, two students (2.4%) learned from a consultant of their mobile device provider, five students (6%) were non-specific as they indicated all of the above in their response (Figure 1).

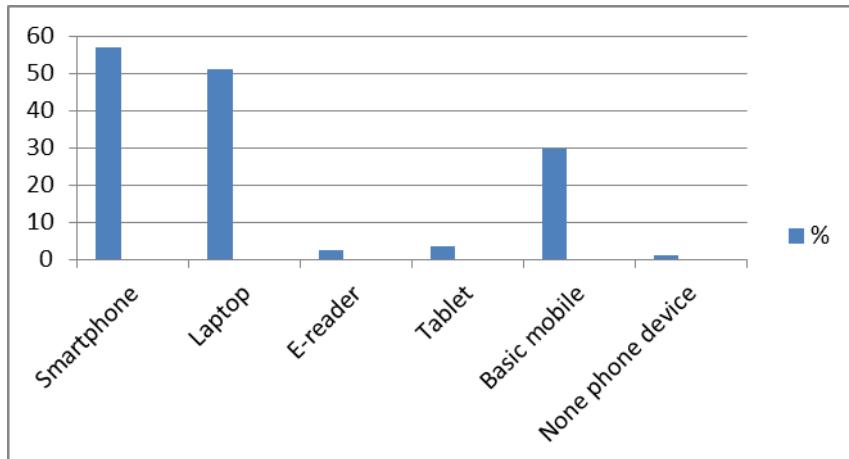


**Figure 1:** Learned to use mobile devices (n=84)

Five of the educators learned how to use their mobile devices as they went along and one educator learned from colleagues / students on campus (n=6).

*Type of mobile device(s) used at the time of the survey (n=84)*

At the time of the survey, 48 students (57.1%) used a smartphone, 43 students (51.2%) used a laptop, two students (2.4%) used an e-reader, three students (3.6%) used a full size tablet, twenty five students (29.8%) used a basic mobile phone (voice, short messaging service [SMS]), with limited or no internet access and one student (1.2%) used a non-phone device (Figure 2).



**Figure 2:** Type of mobile device (n=84)

Two educators used a basic mobile device and four educators used smartphones (n=6). Students in an open question mentioned their accessibility: “Easier, more accessible, faster and time-saving” (n=16).

#### *Time period during which mobile devices are used by respondents (n=84)*

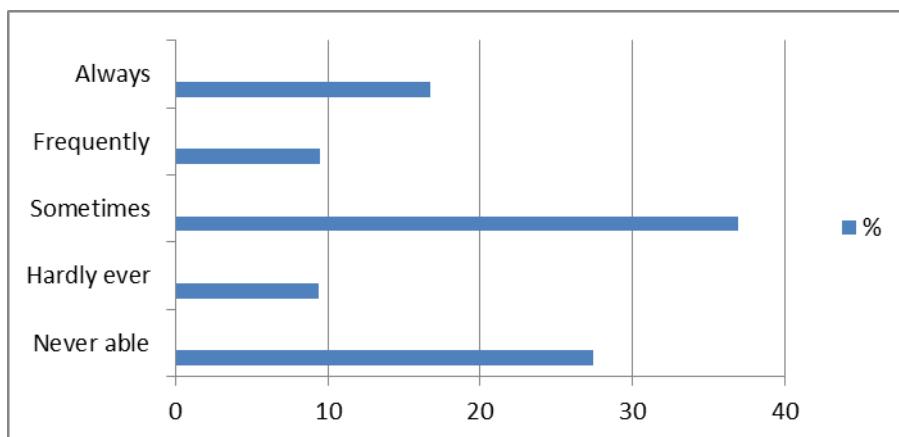
Fifty-two student respondents (61.9%) indicated that they used their mobile device at any available time and seventeen students (20.2%) indicated that they used their mobile device after 16:00 daily. Fifteen students (18%) selected an option from the seven remaining options that indicated that they used their devices either over weekends only or between 06:00 – 10:00 or between 10:00 12:00, etc. This important result informs the planning of an intervention to enhance the teaching and learning of the examination of the Head and Neck for students. To be successful students, they would need to have access to their mobile devices at any time during their clinical placement to either clarify challenges with educators, or to conduct web-based research. Two educators indicated that they used their mobile devices mainly between 12:00 – 14:00, one of the educators used the device after 16:00, and three used their mobile devices at any available time (n=6).

#### *Internet connectivity*

Sixty-six students (78.6%) indicated that they were able to connect to the Internet while off campus while eighteen students (21.4%) indicated that they were not able to (n=84). This information emphasises the importance of access to Internet connectivity for the success of this proposed mobile learning intervention and this result raises a concern for further exploration. All six educators indicated that they were able to connect to the Internet off campus.

#### *Access library databases off campus using mobile devices*

More than a quarter (27.4%) of the student respondents pointed out that they would never be able to use their mobile device to access library databases off campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do their own research on the examination of the Head and Neck in the Primary Health Care Module, 9.4% hardly ever, 36.9% sometimes would, 9.5% frequently did, and 16.7% always did (n=84) (Figure 3).



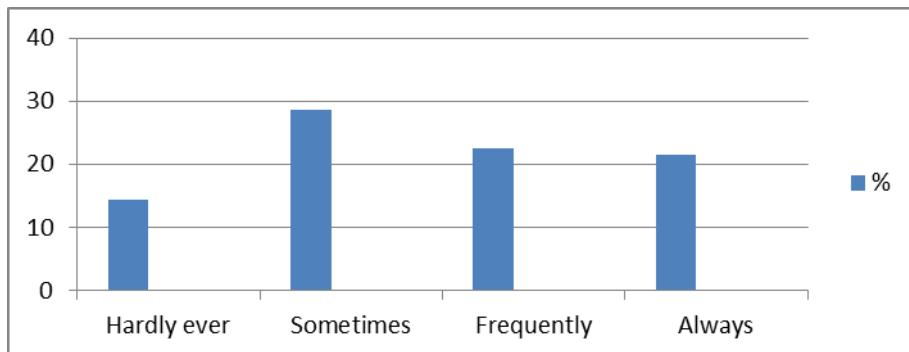
**Figure 3:** Library data basis access (n=84)

This highlights the challenge in guiding students to use these platforms or search engines. Three educators indicated that they would never be able to use their mobile devices to access library databases off campus, e.g. EBSCO, ERIC, PubMed, etc. in order to do their own research on the examination of the Head and Neck in the Primary Health Care Module, one educator sometimes did, one educator frequently did, and one educator always did (n=6). These responses raise a concern for the need to find a platform that is suitable for accessing academic resources by educators for distribution to students.

#### *Willingness to use their mobile devices off campus*

Respondents were asked whether they would be prepared to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. off campus to help with the integration of theory and practice in the course of the examination of the Head and Neck in the Primary Health Care Module. Eleven students (13.1%) pointed out that they would never be prepared to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. to improve the integration of theory and practice in the course of the examination of the Head and Neck in the Primary Health Care Module off campus, 12 students (14.3%) would hardly ever, 24

students (28.6%) sometimes would, 19 students (22.6%) frequently would, and 18 students (21.4%) always would ( $n=84$ ) (Figure 7).



**Figure 4:** Preparedness to use their mobile devices off campus ( $n=84$ )

A challenge arose because 56% of student respondents indicated that they would never to sometimes be prepared to use their mobile devices off campus to improve the integration of theory and practice in the course of the examination of the Head and Neck in the Primary Health Care Module. That was of concern and further investigation and an opportunity were needed to explore the reasons why student respondents were not prepared to use their personal mobile devices to improve the integration of theory and practice. The use of devices possibly has cost implications and the decision to use a device could depend on what kind of mobile device a student has and is convenient to use. Two of the six educators indicated that they would never be willing to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. to assist students when they are off campus with the integration of theory and practice in the context of the examination of the Head and Neck in the Primary Health Care Module. Two indicated that sometimes they would, one of the educators indicated that he or she frequently would, and one of the educators always would. This means that over two thirds of the educators were neither enthusiastic, nor prepared to use their personal mobile devices consistently to communicate with the purpose of facilitating the integration of theory and practice of the examination of the Head and Neck in the Primary Health Care Module.

#### *Mobile applications being used*

The use of mobile applications would be an important guide to establish which application would be most suitable for this research project. The results were as follows: Sixty three students (75.0%) used their mobile devices for Facebook, 67 students (79.8%) used their mobile devices for WhatsApp, 30 students (35.7%) used their mobile devices for BBM, 12 students (14.3%) used their mobile devices for Twitter, 19 students (22.6%) used their mobile devices for Mxit, and

eight students (9.5%) used their mobile devices for email (n=84). The majority of students used the WhatsApp (79.8%) application on their mobile devices.

One of the six educators indicated that no mobile application was being used, one educator used WhatsApp, one educator used Blackberry Messenger (BBM), one used Facebook, Twitter, WhatsApp, Mxit, BBM, and two educators used Facebook, WhatsApp, and BBM.

*Mobile applications most suitable for receiving or reviewing tasks related to coursework*

Student respondents indicated their interest in utilising their mobile applications to review tasks received from educators:

- Thirty nine students (46.4%) were interested in using Facebook;
- Fifty four students (64.3%) were interested in using WhatsApp;
- Twenty three students (27.4%) were interested in using BBM;
- Eight students (9.5%) were interested in using Twitter;
- Nine students (10.7%) were interested in using Mxit; and
- Sixty four students (76.2%) were interested in using email.

The fact that 76.2% of students showed interest in reviewing tasks from educators via email was an interesting finding, since only eight students (9.5%) indicated that they used their mobile devices for accessing their email.

Three of the six educators were interested in using email, e.g. Gmail, Hotmail, Yahoo, etc. to review tasks received from students that were related to their coursework, one educator indicated a preference for using a blog, e.g. Blogger, Wordpress, etc., one educator indicated WhatsApp, BBM & email One educator indicated WhatsApp and email. The most suitable application of choice was the same for both students and educators, since the majority in both groups selected email for receiving or reviewing tasks related to coursework.

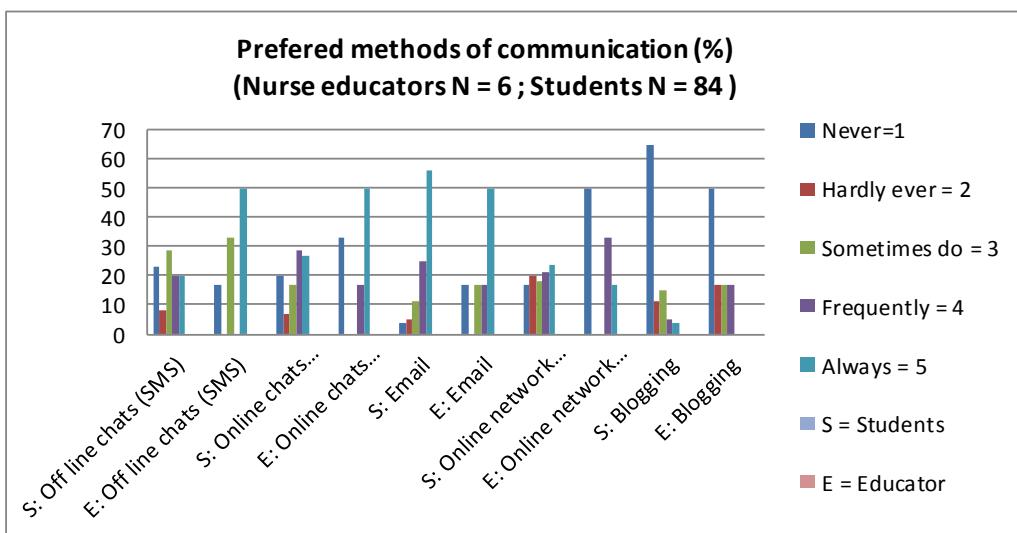
*Mobile devices to enhance the integration of theory and clinical practice*

Seventy-nine students (94%) indicated that in their opinion they believed that mobile devices could be used to enhance the integration of theory and practice of the examination of the Head and Neck in the Primary Health Care Module and only five students (6%) believed they could not use it (n=84). Four educators indicated that they already used their mobile devices to assist students with the integration of theory and clinical practice while two did not use their mobile devices for assisting students with the integration of theory and clinical practice.

In response to an open question, student respondents mentioned: "More convenient in a sense that mobile phones are portable, on the run" (n=5 responses). An educator mentioned: "Mobile devices will enhance integration between theory and practice for our students in many modules and teaching platforms".

### *Communication*

An overview of the preferred method of communication for students and educators is presented in Figure 5. This structured question used the Likert scale that required respondents to indicate to what extent they disagreed or agreed with a given statement (1=never – 5=always) (Figure 5).



**Figure 5:** Preferred method of communication (n=84)

Four educators indicated email as a preferred method of electronic communication, one indicated not applicable and another one indicated none. Email seems strongly suggested as a means of communication amongst facilitators / educators. In an open question affirmative responses were made by students about mobile learning with regard to the usefulness of mobile devices in communication (Table 1).

**Table 1:** Usefulness of mobile devices in communication (n=26)

Statements	Number of responses (n)
Mobile devices are easier, more accessible, faster and time-saving	16
More convenient as they are portable	5
Chance for a student to ask questions to your lecturer related to the study or any module they are struggling with anytime	5

Adverse responses were also made:

*“Not if everyone does not have the availability” (n=3).*

*“Sometimes phone doesn't open large file that's why most of the time I choose to use email account” (n=3).*

To an open question, affirmative responses were made by educators:

*“Yes, if planned properly and students and lecturers get orientation on how [to] use the service, it can be achieved (the integration of theory and clinical practice)” (n=1).*

*“Technology is cheaper form of communication for both students and lecturers to enhance learning and immediate feedback, debates” (n=1).*

*“Used effectively if [you] want to know more / did not understand something clearly - immediate connect for clarification” (n=1).*

### ***Perspective of nurse educators***

#### *Finding and distributing content to students using mobile devices*

One of the six educators indicated that she would never be able to find and distribute content to students from the Internet that would be relevant to the course content by means of a mobile device. It would appear that some of the educators were already able to find and distribute content to students from the Internet that was relevant to the course content by means of their mobile devices. The survey sought responses to questions, such as which application did educators use to disseminate information to students, how did they ensure that the information reached the students timely, and was there any evidence that students received, read, and applied the information received? These questions identified the need to further probe this topic to gain clarity and information about what could assist with the planning and implementation of a mobile learning intervention that would enhance the integration of theory and practice.

#### *Developing content in an online learning environment for students using mobile devices*

One of the educator respondents indicated that she would never be able to use his or her mobile device to develop his or her own content in an online learning environment for students to use, one of the educator respondents would hardly ever be able to, one of the educator respondents would sometimes be able to, one of the educator respondents would frequently be able to, and two of them would always be able to.

*Sending course information using mobile devices*

One of the educators (n=6) indicated that he/she would never use her mobile device to send course information to students, e.g. changes in classes, assignment deadlines, etc.; Another educator indicated that he would hardly ever use it. It would appear that educator respondents were inclined to use their mobile devices to send course information to students as they sometimes did and two educators indicated that they always did.

*Review course related pictures and videos made by students using mobile devices*

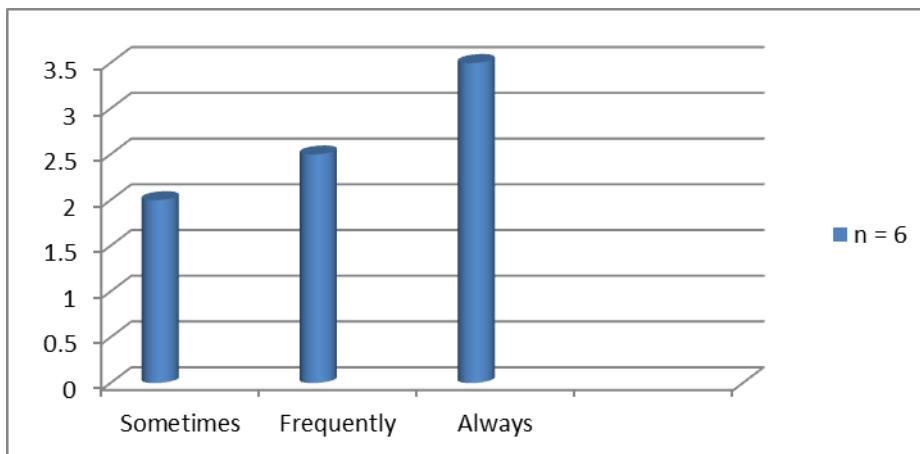
Since 50 per cent (n=3) of the educator respondents indicated that they did not use their mobile devices to review course related pictures and videos made by students, there would be a need for exploring the reasons for this phenomenon to ensure real-time feedback and availability of appropriate information or resource material to students in an effort to increase learning and retention.

*Academic support to students using mobile devices*

Three educator respondents indicated that they would never use their mobile devices to chat with students via WhatsApp, Mxit, Facebook, etc. and to offer them academic support, one educator respondent frequently did, and only two of them always did. This may lead to an absence of real-time information being provided to students, since there is a 50/50 indication for and against the use of their mobile devices by educator respondents to chat with students via WhatsApp, Mxit, Facebook, etc. and to offer students' academic support.

*Willingness to use their mobile devices to help students with the integration of theory and practice*

Two educator respondents were sometimes prepared to use their mobile devices, e.g. smartphones, notebooks, laptops, etc. for assisting students off campus with the integration of theory and practice in the course for the examination of the Head and Neck in the Primary Health Care Module, three educator respondents frequently were, and one educator respondent was always prepared to use devices (Figure 6). The need still existed to get the endorsement of all educators to willingly use their mobile devices, e.g. smartphones, notebooks, laptops, etc. to assist students with the integration of theory and practice in this course.



**Figure 6:** Educators' willingness to use their mobile devices

## Discussion

The perceptions of student and educator respondents about the potential use of mobile devices in an undergraduate nursing module indicated their preferred interaction with the social networking services of WhatsApp (79.8%), Facebook (75%), Mxit (22.6%), etc. Educator respondents indicated that they made use of WhatsApp, Mxit, Facebook and other applications to offer academic support to students. In another study amongst physiotherapy students about the knowledge and attitudes in relation to the use of social applications, a few students indicated that they had a high level of experience with some common social networking service, e.g. Mxit (84%) and Facebook (81%).

Most mobile phone users communicate using short message services (SMSs) due to their affordability, especially for those who cannot afford the high cost of cell phone calls. Handheld or mobile devices provide nurses with a reference library in their pockets. Depending on their Internet connectivity, nurses are able to search for drug formularies, textbooks or journal information about the latest evidence-based practices. The latter was also confirmed in a study amongst community health students from Northumbria University in the United Kingdom indicates that mobile technology is used to access clinical applications, such as electronic textbooks and medical calculators (Walton, Childst & Blenkinsopp, 2005).

Wireless devices, as individualised and collaborative communication tools, have the ability to extend learning beyond the classroom walls into areas such as hospitals, homes, airports, busses, taxis, and trains where students may not have direct or immediate access to a computer (George, Davidson, Serapiglia, Barla & Thotakura, 2010; Siemens & Tittenberg, 2009).

A student from the Department of Nursing Studies at the University of Hong Kong indicated that she used her mobile device to access learning materials for course revision more frequently before examinations; it enabled her to study anywhere, anytime, and it gave her more time. This research project sought to determine whether the provision of a mobile device would encourage the involvement of respondents. Generally, educator respondents in this study indicated that they would be willing to use their mobile devices to assist students with the integration of theory and practice. Song (2011) reports on an in-depth one-year empirical research study that reflects the perspective of five undergraduate students on how the use of mobile devices supported their studies. Mobile devices were provided to the students free of charge and they received a one-year mobile service package that motivated them to make full use of their mobile devices. Student interaction with their mobile devices were affected by interrelated factors such as goals, tasks, learning resources, mobile device capabilities and constraints, time and place, social factors, and individual interpretations. Learning tasks of the students also varied according to the task at hand, e.g. tasks defined by the teacher (e.g. writing project reports), tasks defined by the student (e.g. course review), and tasks emerging in context (e.g. recording lectures in class).

During clinical courses in nursing practice, mobile learning has been used to amalgamate instructors, peers, and resources by using mobile devices at the point-of-care to enhance students' safety and evidence-informed practice (Kenny, Van Neste-Kenny, Burton, Park & Qayyum, 2012). It could be argued that mobile learning could also be effective in supporting the teaching and learning of nursing students, for example, with students integrating theory in their practice. Fundamental changes in curriculum design and delivery at HEIs using the appropriate emerging technology could provide students in the 21st century with an opportunity to enhance their learning (Bates & Sangra, 2011). Although the results in this study indicated that seventy nine student respondents (94%) believed that mobile devices could be used to improve the integration of theory and practice for this module, no definite application emerged to guide the use of their mobile devices to facilitate this process. The educator respondents' survey results indicated that there was a need for increased endorsement by educators to engage with mobile devices with the purpose of assisting students with the integration of theory and practice of this module. Some educators already started using their mobile devices to assist students with the integration of theory and practice, yet there were educators who were not prepared to use their mobile devices for assisting students with the integration of theory and practice.

The respective surveys of the students and educators yielded the need for a workshop on the use of mobile applications. A workshop is recommendable that

will ensure that no student is disadvantaged; e.g. due to a lack of knowledge, when the use of a device is introduced to improve the integration of theory and practice for examination of the Head and Neck in the Primary Health Care Module.

## **Conclusion**

The study revealed the need for clarification and deeper exploration of some of the results that could be conducted by employing qualitative research methods, e.g. focus group sessions and individual interviews in conjunction with the capturing of field and observational notes. Such a research project may provide an opportunity to collate an accurate exploration and description of the research problem identified without manipulating the data obtained. The results revealed the extent to which and involvement of students and educators in relation to their existing use of mobile devices for the integration of theory and practice in this module. In a modern society of mobile technology, students and educators should be educated to use mobile devices to enhance quality teaching moments.

## **Acknowledgements**

The authors wish to thank the Emerging ICT in Higher Education group, with Professor Vivienne Bozalek as the Principal Investigator, for their continued guidance and the National Research Foundation for funding that made the completion of this research project possible.

## **References**

- Bates, A. & Sangrà, A. (2011). *Managing Technology in Higher Education: Strategies for Transforming Teaching and Learning*. San Francisco: Jossey-Bass/John Wiley and Co.
- Cook, J., Pachler, N. & Bradley, C. (2008). Bridging the Gap? Mobile phones at the interface between informal and formal learning. *Journal of the Research Center for Educational Technology*, 4 (1), 3-18.
- De Vos, A.S., Strydom, H., Fouché, C.B. & Delport, C.S.L. (2011). *Research at Grass Roots: For the social sciences and human service professions* (4<sup>th</sup> ed.). Hatfield: Van Schaik Publishers.
- George, L.E., Davidson, L.J., Serapiglia, C.P., Barla S. & Thotakura, A. (2010). Technology in nursing education: a study of PDA use by students. *Journal of Professional Nursing*, 26(6), 371-376.
- Gupta, B. & Koo, Y. (2010). Applications of M-learning in Higher Education: An empirical study. *International Journal of Information and Communication Technology Education*, 6 (3), 75-87.

- Kenny, R.F., Van Neste-Kenny, J.M.C., Burton, P., Park, C.L. & Qayyum, A. (2012). Using Self-Efficacy to Assess the Readiness of Nursing Educators and Students for M-learning. *International Review of Research in Open and Distance Learning*, 13(3), 277-296.
- Mason, R. & Rennie, F. (2008). *E-Learning and Social Networking Handbook. Resources for Higher Education*. New York: Routledge.
- Nordin, N., Embi, M.A. & Yunus, M. (2010). M-learning Framework for Lifelong Learning. *Procedia Social and Behavioral Sciences*, 7 (C), 130-138.
- Pachler, N., Bachmair, B. & Cook, J. (2010). *M-learning. Structures, Agency, Practices*. New York: Springer.
- Park, C.L., Van Neste-Kenny, J.M. C., Burton, P.A. & Kenny, R.F. (2010). A model of mobile faculty presence in nursing education practice. *Canadian Journal of Nursing Informatics*, 5(3), 21–42.
- Polit, D.F. & Beck, C.T. (2012). *Nursing Research. Generating and Assessing Evidence for Nursing Practice*. (9<sup>th</sup> ed.). China: Wolters Kluwer Health/ Lippincott Williams & Wilkins.
- Rowe, M., Bozalek, V. & Frantz, J. (2013). Using Google Drive to facilitate a blended approach to authentic learning. *British Journal of Educational Technology*, 44 (4), 1-7.
- Saunders, M., Lewis, P. & Thornhill, A. (2009). *Research Methods for Business Students* (5<sup>th</sup> ed.). Harlow, England: Prentice Hall.
- Siemens, G. & Tittenberger, P. (2009). *Handbook of Emerging Technologies for learning*. Available: [http://www.umanitoba.ca/learning\\_technologies/cetl/HETL.pdf](http://www.umanitoba.ca/learning_technologies/cetl/HETL.pdf). (Accessed 15 August 2014).
- Song, Y. (2011). Investigating undergraduate student mobile device use in context. In Kitchenham, A. *Models for Interdisciplinary Mobile Learning. Delivering Information to Students*. Hershey, USA: Information Science Reference.
- Walton, G., Childst, S. & Blenkinsopp, E. (2005). Using mobile technologies to give health students access to learning resources in the UK community setting. *Health Information and Libraries Journal*, 22, 55.
- Watson, R., McKenna, H., Cowman S. & Keady, J. (2008). *Nursing Research: Designs and Methods*. Edinburgh: Churchill Livingstone.