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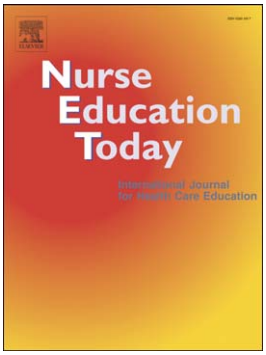

The potential of mobile technology (MoTech) to close the theory practice gap

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THE POTENTIAL OF MOBILE TECHNOLOGY (#MoTech) TO CLOSE THE THEORY PRACTICE GAP.

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The potential of mobile technology (#MoTech) to close the theory practice gap.

INTRODUCTION:

This paper, originally presented at the global nurse education conference NETNEP 2016 (Williams and Roberts 2016) explores the potential of mobile technology as an aid for learning and teaching in clinical practice and the subsequent potential for closing the theory practice gap. Whilst some authors suggest that mobile technology has negative connotations, and there is a misconception of the platform such as mobile phones being a distraction or unprofessional if used by nurses in clinical practice; to balance this perspective we outline three potentially positive aspects to using mobile technology to support clinical learning. Such as:

1. The use of Apps to provide clinicians with better access to current evidence with the potential to reduce drug errors or adverse incidents and promote the uptake of research in practice. On average students use their mobile devices 11 times during the day (McCoy, 2013) so accessing Apps is one way to exploit and take advantage of social media.

2. The potential that the academic practice gap is closed as the mobile technology provides an Immediacy and less threatening connection; for example tweeting breaks down the academic/student barriers (Chinn, 2015).

3. Best practice and an evidence base may be generated in real time by using the wisdom of the crowd (Sinclair *et al.* 2015).

The use of mobile technology is being explored within the United Kingdom as highlighted by the Department of Health (2016), NHS England investigates the use of emerging tools with patients who have chronic conditions such as diabetes, cardiac and respiratory problems. Some NHS Trusts are using text messages as a method of patient self-management or automated healthcare through 'virtual nurses' on smartphone apps to better manage patient symptoms. Similarly, the use of Artificial intelligence (AI) is an area of rapid expansion, where computers have the potential to analyse reports and provide earlier detection of health problems such as cancers and other clinical

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decision making situations, often in real time. In addition, the use of Avatars and simulated worlds is familiar to many in the world of gaming. The use of technology is generational (Leung, 2013) suggesting the adoption of mobile technology within nurse education, the clinical environment, for healthcare professionals and patients will become more accepted as the net generation grows up. Therefore if technologies are being utilised by patients then it seems only fitting for such technology to be embraced by nurse education.

There is no doubt that mobile technology is here to stay and that there is a rapid evolution of the use of mobile technology to support teaching and learning on a global scale. According to Martin and Ertzberger (2013) mobile technology has facilitated learners to have immediate access to information enabling them to undertake authentic contextual learning both inside and outside the classroom; which they suggest is a new type of 'here and now' learning (Martin and Ertzberger 2013: 76). They go on to point out that mobile technology has become part of everyday life and cite figures that suggest 6 billion mobile subscriptions at the end of 2011, with the majority of people accessing the Internet via mobile devices. Mobile learning is a seamless blend of mobile computing and e learning enabling interaction, search facilities and access to resources anytime, anywhere through hand held devices including mobile phones, personal digital assistant, mini computers and i-pads. As such, learners such as nursing students who spend much of their time in clinical practice, now potentially have access to information that is directly related to what they see and experience in real time.

MOBILE APPLICATIONS (Apps):

Most people own a mobile phone, smartphone or tablet computer and therefore are able to access mobile applications (Apps) (Aungst *et al.* 2014). Recently the growth in Medical Apps e.g. the use of apps such as NICE, BNF (see https://www.nice.org.uk/about/what-we-do/nice-apps-for-smartphones-and-tablets), NEWS Wales, (see http://www.1000livesplus.wales.nhs.uk/news/23625) is increasing at a significant rate. Harnessing the use of these Apps and incorporating them in to daily

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clinical work as a resource, and tool, is one way to exploit and take advantage of social media. Aungst et al, (2014) point out that this would need to be done in a sensible and monitored fashion to ensure accuracy and maintain patient safety. Furthermore, some nursing students find the cost of mobile technology a burden (Connor and Andrews, 2015). However, there is scope to explore innovative ways to address this situation. For example, Altmann and Brady (2005) explored this problem by looking at a student loan programme whereby students loan/hire a mobile or consider ways of donating old devices to the school of nursing for student use when upgrading devices to reduce the barrier of cost. The mobile device loan service would be for exclusive use in the clinical environment (Mann et al, 2015)

In order to address potential ethical issues it would be useful to download to each device recommended software for example, drug references/ drug interactions on the BNF App; medical dictionary on the Oxford Medical App. This would ensure the students would have access to relevant Apps. Students could be provided with a list of specific Apps to download. To reduce the barriers to implementation, training on how to use the devices could be delivered in how to use them in the clinical setting (Mann et al, 2015).

In addition to mobile phone applications, the more traditional functions of phones themselves have been used to support learning. For example, Young *et al.* (2010) describe the findings from a pilot study undertaken in the UK to use short message service (SMS) texts to support a diverse range of healthcare students whilst in practice placements. The texting service was initiated to be an additional support measure rather than to replace other support mechanisms. A total of 59 students volunteered to participate; sending 57 messages from 36 students. The data revealed that students tended to ask questions via text during normal working hours for personal advice, placement issue, health issue, academic issue, social contact, project query and technical system use (mainly confirmation of receipt of messages). Only one of the four tutors engaged in the pilot used the texts to proactively communicate with students; yet the tutors were generally positive about the potential

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for text use. The authors suggest that texting facilitated the tutors to feel more in touch with their students. Students felt that texting was private, confidential, intimate and informal and improved placement support. Uptake of the service by students was generally low with 11 using texts to contact their tutor and 29 not doing so. Reasons cited for lack of use centered around not having any problems to report, although 35 students appreciated having the service to hand. Further, large scale research is required to provide an evidence base to support whether such Apps are useful in supporting clinical learning; and whether students use Apps alone, with peers or patients etc.

CONNECTEDNESS AND CLOSING THE ACADEMIC PRACTICE GAP:

Social media has been shown to be a useful support mechanism for students prior to starting a university programme in the USA. In a study using a peer driven (student only) social media site prior to student arrival on campus DeAndrea *et al.* (2012) demonstrated that using the social media site increased student's perceptions that a diverse social support network was available and accessible. The site enabled peer to peer messaging (as opposed to unidirectional transmission of one to many) in order to foster students feelings of being connected to the university. The students used the site to provide peer support and as an information exchange. The summer before arriving on campus may provoke anxiety for students and sources of social support may be particularly valuable at this time. Furthermore, the study suggests that enhancing student self-belief prior to arrival on campus results in students setting and achieving higher goals. Interestingly the participants were mostly female (70% of 265 participants) whilst the authors do not investigate whether there are particular implications for women requiring such support; there may be implications in terms of gender for student nurses which requires further investigation. Nursing students in particular seem to benefit from feelings associated with belonging and connectedness (Levett-Jones and Lathlean 2008); so from a nurse education perspective this may be an important consideration.

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Within the literature describing the use of social media to support learning, Sinclair *et al*, (2015) suggest that nurses are educated in three interlinked arenas; the familiar classroom and practice arenas, and a third virtual arena that transposes both, constructed through social media, such as Twitter and other platforms. The use of social media facilitates communication in real time and accentuates feelings of connectedness. In particular, Sinclair *et al*, (2015) suggest that the use of social media platforms have the potential to enable communication and dialogue between students, prospective students, educators, the university, clinical partners, mentors and service users. Their study suggests that the chatter is becoming more professional rather than social; although it should be remembered that the study did not specifically set out to collect data whilst students were engaged in practice; therefore it remains to be seen whether such real time communication is important during real world practice. In a Canadian mixed methods study of medical students and teachers Wallace, Clarke and White (2012) describe how mobile devices were used mainly for information management, communication and time management purposes. The participants used their mobile devices in both classroom and clinical areas to retrieve information on the go; such as unfamiliar terms or conditions; with 48% of the 86 students doing so on a daily basis. Being able to look up information was seen as a way of reinforcing and double checking personal knowledge; although only four data extracts are presented to illuminate this theme. The study highlights that some participants were using sites such as Wikipedia as a source of information; indicating that being able to make judgements about the quality of information found can be an issue. Being able to distinguish good learning resources and achieve deeper rather than superficial learning is highlighted as a challenge by Wallace *et al*, (2012).

Dearnley *et al.* (2008) used pocket personal computers to record assessment documentation including action plans and evidence of achieving performance criteria in a pocket portfolio with twenty four student midwives and five lecturers in a UK based study. The device was synchronised with the university electronic diary which the lecturing staff cited as being useful. The students liked the convenience of the pocket device as they were able to use the word processing function of the

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personal computer to add and amend information whilst in practice which the participants felt made the records neater and more readable. One example of data suggests that the mobile device helped the student to overcome general barriers to writing; although students also maintained a paper based pocket notebook which assumedly provided the same function. Interestingly, Dearnley *et al*, highlight that very little of the data appeared to relate to learning in practice; as students used the diary and games function of the PC; unlike the medical students in the study by Wallace *et al.* (2012).

According to the professional body for nursing in the UK, the Nursing and Midwifery Council (NMC) (2015) the sensible and correct use of social networking sites e.g. Twitter, can be beneficial for nurses, midwives and students. The benefits include the provision of supportive networks; making professional relationships and being able to access resources for continuing professional development (NMC 2015). However, an area that is significant and requires a strong message from educators is that health professionals need to act responsibly at all times irrespective of the mode of contact. There is a lack of understanding and fear around the use of social media within the health service and for example the use of social media to support CPD in the workplace in the UK is patchy. There is the potential to use social networks to provide educative support. Mobile technology may be particularly useful in remote and resource poor areas. A study of 16 nurses attending an advanced midwifery programme in rural South Africa demonstrated that through the use of mobile technology the participants were able to stay connected and provide each other with emotional support which contributed to an enhanced feeling of belongingness (Pimmer *et al.* 2014).

The impact of mobile devices on enabling students to achieve educational objectives also warrants further study. It would seem that there is potential for students to use evolving technology to help gather and record evidence of achievement of core competencies. Within the UK the standards to support learning and assessment in practice are under review (NMC 2008), but within the current standards there are elements that relate to both teachers, mentors and students that could be

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interpreted in such a way that the judicious use of mobile devices would be appropriate. Rutledge *et al.* (2011) demonstrate how a group of students (albeit on an Advanced Practice Doctoral programme) were able to construct a social media care plan using healthcare technology to improve health outcomes.

USING THE WISDOM OF THE CROWD TO GENERATE EVIDENCE:

The immediacy of mobile technology means that nurses can communicate in a global community to generate real world evidence. It is possible that nurses could contribute to new and emerging bodies of evidence at the point of care as they collate contextually relevant information; although such global connections are yet to be tested. If it is possible to support mentoring through real time support, (as suggested by Sinclair *et al,* (2015), it may also be possible to support care delivery in the same way via the collective voice of the community of practice. More work is required to test the feasibility of using the wisdom of the crowd to generate nursing knowledge.

WORDS OF CAUTION:

It is important not note that whilst the aim of this paper is to present the positive aspects associated with using mobile devices at the bedside; that such innovation should proceed with caution. For example, Ulger *et al.* (2009) examined the mobile phones of healthcare support workers from intensive care and operating theatres and discovered what they describe as a "high contamination rate with bacteria but also more importantly contamination with nosocomial pathogens" (p3). The authors point out the need for strict training protocols to optimise decontamination; however the potential for cross-infection is clear.

It should also be remembered that access to wireless connectivity is not universal; remote and resource poor areas cab result in nurses being professionally and educationally isolated (Pimmer *et al.* 2914). In addition access to computers may not always be available in clinical areas; and even

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where they are available firewalls often prevent access to the internet and subsequent information at the point of care.

CONCLUSIONS:

The Department of Health (2016) supports our belief that using cutting edge technology within nurse education has the potential to provide health care students and educators the opportunity to develop essential skills required to deliver safe and effective patient care. The use of smartphones is identified by the Kings Fund (Honeyman *et al.* 2016) as one of the technologies which will impact on healthcare in the next 10 years. Thousands of health apps are already easily accessible. The use of Apps as resources is increasing due to ease of accessing information and using mobile technology is favoured by the current generation in addition to accessing to computers. The difficulty has been in curating the most credible ones (Huckvale *et al,* 2015). Within nurse education mobile technology could be used more effectively to enhance feelings of belonging prior to, and during pre-registration programmes and has the potential to facilitate connections between academics and students whilst students are in clinical placements or away from the University; and therefore nurse educators need to have a better understanding of how to capture and exploit such potential. However it remains unclear whether the use of mobile technology at the bedside as an aide to learning and or care delivery is feasible or desirable.

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References:

Altmann,T.K., and Brady, D. 2005pdaS BRING INFORMATION COMPETENCE TO THE POINT-OF-CARE. International Journal of Nursing Education Scholarship. 2:1-10

Aungst, T., Clauson, K., Misra,S., Lewis, T. and Husain,I. (2014) 'How to identify, assess and utilise mobile medical applications to clinical practice', The International Journal of Clinical Practice pp.155 - 162

Chinn, T. 2015 'Twitter triumph: connect, communicate, and learn', British Journal of Community Nursing pp. 214-216

Connor, S. and Andrews, T. 2015 Mobile Technology and Its Use in Clinical Nursing Education: A Literature Review. Journal of Nursing Education. 54:137-144

DeAndrea, D.C., Ellison, N.B., LaRose, R., Steinfield, C. and Fiore, A. 2012 Serious social media: On the use of social media for improving students' adjustment to college. Internet and Higher Education. 15: 15-23.

Dearnley, C., Haigh, J., and Fairhall, J. 2008. Using mobile technologies for assessment and learning in practice settings: A case study. Nurse Education in Practice. 8: 197-204.

Department of Health. 2016. Policy paper: personalised health and care 2020: a framework for action. Accessed on 20.10.16 via: https://www.gov.uk/government/publications/personalised-health-and-care-2020/using-data-and-technology-to-transform-outcomes-for-patients-and-citizens

Honeyman, M., Dunn, P., and McKenna, H. 2016. A digital NHS? An introduction to the digital agenda and plans for implementation. The King's Fund. September 2016. Accessed on 20.10.16 via: http://www.kingsfund.org.uk/sites/files/kf/field/field_publication_file/A_digital_NHS_Kings_Fund_Sep_2016.pdf

ACCEPTED MANUSCRIPT

Huckvale K, Morrison C, Ouyang J, Ghaghda A, Car J. 2015.The evolution of mobile apps for asthma: an updated systematic assessment of content and tools. BMC Med. 2015 Mar 23;13:58. Doi:10.1186/s12916-015- 0303-x

Leung, L. 2013. Generational differences in content generation in social media: The roles of the gratifications sought and of narcissism. Computers in Human Behavior Volume 29, Issue 3, May 2013, Pages 997–1006.

Levett-Jones, T. and Lathlean, J. 2008. Belongingness: a prerequisite for nursing students' clinical learning. Nurse Education in Practice. 2008 Mar;8(2):103-11. doi: 10.1016/j.nepr.2007.04.003. Epub 2007 May 31.

Mann, E., Medves, J., and Vandenkerkhof, E. 2015 Accessing Best resources Using Mobile Technology in an Undergraduate Nursing Program; a Feasibility Study. Computers, Informatics, Nursing. 33: 122-128

Martin, F., and Ertzberger, J. 2013. Here and now mobile learning: An experimental study on the use of mobile technology. Computers and Education. 68: 76-85.

McCoy, B. 2013 'Distractions in the classroom: Student classroom use of digital devices for non-class related purposes', Journal of Media Education pp.5-14.

Nursing and Midwifery Council (2008) Standards to support learning and assessment in practice. NMC. Accessed on 9.2.17 via: https://www.nmc.org.uk/standards/additional-standards/standards-to-support-learning-and-assessment-in-practice/

Nursing and Midwifery Council (2015) Guidance on using social media responsibly London: NMC. Accessed on 20.10.16 via: https://www.nmc.org.uk/globalassets/sitedocuments/nmc-publications/social-media-guidance.pdf

ACCEPTED MANUSCRIPT

Pimmer, C., Brysiewicz, P., Linxen, S., Walters, F., Chipps, J., and Grohbiel U. 2014 Informal mobile learning in nurse education and practice in remote areas-A case study from rural South Africa. Nurse Education Today. 34: 1398-1404.

Rutledge CM., Renaud M., Shepherd L., Borderlon M., Haney T., Gregory D. and Ayers P. 2011. Educating Advanced Practice Nurses in Using Social Media in Rural Health Care. International Journal of Nursing Education Scholarship. 8 (10): Article 25.

Sinclair W., McLoughlin M., and Warne T. 2015. To Twitter to Woo: Harnessing the power of Social media (SoMe) in nurse education to enhance the student's experience. Nurse Education in Practice. 15 (6): 507-511.

Ulger F., Esen S., Dilek A., Yanik K., Gunaydin M., and Leblebicioglu H. 2009. Are we aware how contaminated our mobile phones with nosocomial pathogens? Annals of Clinical Microbiology and Antimicrobials 2009, 8:7 doi:10.1186/1476-0711-8-7

Wallace S., Clarke M., and White, J., 2012. 'It's on my i-Phone': attitudes to the use of mobile computing devices in medical education, a mixed-methods study. BMJ Open 2012; 2: e001099. Doi:10.1136/bmjopen-2012-001099

Williams, A.M. and Roberts, D. 2016. The potential of mobile technology to close the theory practice gap. NETNEP 2016. The 6th International Nurse Education Conference, Transforming Education practice through scholarship, development of academic leadership and evaluation research: committed to improving the lives of communities worldwide. Brisbane 3-6th April 2016.

Young, P., Moore, E., Griffiths, G., Raine, R., Stewart, R., Cownie M., and Frutos-Perez, M. 2010. Help is just a text away: The short message service texting to provide an additional means of support for healthcare students during practice placements. Nurse Education Today. 30: 118-123.

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Highlights:

- There may be positive aspects to using mobile technology at the bedside
- Apps enhance access to current evidence
- Mobile technology enhances student teacher connectedness
- Mobile technology is particularly useful in remote areas for both learning and care delivery

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