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The use of information and communication technology by South African physiotherapy students

M. Rowe & P. Struthers

Abstract

The global shift toward the use of information and communication technology (ICT) in health education and practice has been shown to enhance both the educational opportunities and the support provided to students and healthcare professionals. This study aimed to investigate the use of ICT by South African physiotherapy students and what their experiences and perceptions were regarding their use of ICT as part of their studies. The study design was a cross-sectional, descriptive survey using a self-administered questionnaire. The survey population included all of the undergraduate physiotherapy students from six of the eight universities offering the physiotherapy degree in South Africa (N=1105). The sample size consisted of 529 students from the survey population who completed and returned questionnaires, indicating a response rate of 48%. The results of the study showed that the use of ICT by South African physiotherapy students varied according to task, racial group and university attended. Furthermore, the reported use of ICT for communication, research and continuing professional development was low. In conclusion, this study indicates that with a move toward the use of ICT to enhance health education and practice in South Africa, certain groups of physiotherapy students may be at a disadvantage if required to make use of ICT as a means of improving communication, enhancing education, participating in lifelong learning opportunities and accessing support.

Keywords: information and communication technology, physiotherapy, students, South Africa, education

Introduction

The use of information and communication technology (ICT) in all spheres of human endeavour has become increasingly evident over the past decade, with people of all ages making use of computers and the Internet to interact, communicate and do business on a daily basis (Louw & Hanmer, 2002). In South Africa, the increasing availability of broadband Internet access has resulted in the rise of social networking, online consumer forums and multimedia on demand services that are changing the way we communicate and engage with each other. However, while the use of ICT in many aspects of society has increased, not everyone has equal access to technology, partly as a result of the policies of apartheid prior to 1994 (Bozalek et al, 2007). This has led to a phenomenon known as the "digital divide", or the gap between those with access to technology and those without (Samuel et al, 2004).

Despite this, the use of ICT to facilitate learning has found support among many scholars (Oblinger & Oblinger, 2005; Rohleder et al, 2007). The South African government has also indicated that ICT has the potential to improve the quality of education and training and has pledged to "...invest in national initiatives to increase access...and provide electronic resources of the highest quality..." to students in South Africa (Department of Education, 2004, p. 11). This investment in technology is essential, as today's students in higher education are part of the first generation to have access to the vast resources of the Internet and who use it regularly. There is also evidence that they are not only comfortable with

mrowe@uwc.ac.za

technology, but that it has fundamentally changed the way they communicate and learn (Barnes et al, 2007). This change has led to educators in higher education questioning how their institutions are adapting to take advantage of these new tools and the new methods of teaching that they enable (Oblinger & Oblinger, 2005).

Social constructivism is one theoretical approach that advocates the use of ICT in education, as it facilitates active student engagement with content, educators and each other, enhances problem-based learning, improves information gathering skills, improves communication between educators and students, ensures the accessibility of coursework and enhances administrative tasks (Johns, 2003; Oblinger & Oblinger, 2005; Rohleder et al, 2007). The use of ICT in education has also been shown to increase the channels of communication and facilitate collaborative learning (Boulos et al, 2006), creating a framework for the social construction of knowledge. These characteristics of the use of ICT in education allow students to take greater responsibility for learning, and for educators to act as facilitators of learning.

The use of ICT in clinical practice has been shown to facilitate evidence based practice (EBP); improve the opportunities for continuing professional development (CPD); and enhance communication between colleagues (Rowe, 2008). However, while many physiotherapists support the concept of EBP in principle, many found it hard to implement due to a lack of access to literature and isolation from their peers (Grimmer-Sommers et al, 2007). These issues with EBP have been identified as ones which could potentially be addressed through the use of ICT (Hill & Alexander, 1996; Mitchell et al, 2001; Taylor & Lee, 2005). Therefore, if ICT is going to be the means by which clinicians gain access to the latest evidence as part of their practice, it indicates a need for healthcare students to be literate in its use. In fact, computer literacy has been recognised as an essential skill for future healthcare professionals to function effectively in an increasingly digital workplace (Samuel et al, 2004; Kingsley & Kingsley, 2009).

In terms of the actual acquisition of these skills, doctors in the United Kingdom (UK) have reported that self-directed learning was the means by which they learned how to use a computer (National Health Service, 1998). With a lack of access to ICT resources in South Africa (Bozalek, 2007), self-directed learning as a means of acquiring these skills may not be a feasible solution. Other studies have identified more problems with the use of ICT in medical education, including the fact that there is often poor engagement with content when materials are poorly designed, both staff and students need adequate training in order to make use of computer assisted learning tools, and there is often resistance to change (Greenhalgh, 2004; Kingsley & Kingsley, 2009). Together with the high cost of developing digital resources and the poor time management that is often associated with e-learning and distance learning (Martin, 2007), it is evident that the implementation of ICT in healthcare education should be undertaken with caution and careful deliberation.

Aim of the study

While there is a significant worldwide shift towards the use of ICT to enhance healthcare education and clinical practice, its use among South African physiotherapy students has not been well documented. Thus, the aim of the study was to determine which ICT resources South African physiotherapy students use during their undergraduate education, and what their experiences and perceptions were regarding that use.

Methodology

A cross-sectional, descriptive survey was used to determine the use of ICT among physiotherapy students at six of the eight training institutions in South Africa, in 2007. The population for the study included all registered undergraduate physiotherapy students in the country. However, for logistical reasons the Universities of the Free State and Pretoria were unable to participate, with the Universities of Cape Town, Kwazulu-Natal, Limpopo, Stellenbosch, Western Cape and Witwatersrand yielding a sample of 1105 students. No exclusions were made.

As no validated, reliable instrument could be found, a self-developed questionnaire was used, which was based on questionnaires used in similar studies identified in the literature, as well as the authors personal experiences. The questionnaire was divided into three sections that were based on the areas in which information was sought and that would satisfy the objectives of the study. The sections included: demographic information; use of ICT at university and at home; students' experiences and perceptions of support; and use of ICT. A combination of Likert scales, "Yes/No" answers and one open-ended question were used to gather information. A pilot study was conducted with a small group of newly qualified physiotherapists, in order to improve the content validity of the questionnaire. Irrelevant or ambiguous questions were either modified or removed so that reliability could be improved. The response rate was maximised by using stamped, self-addressed envelopes; including cover letters; sending reminders to participants; and offering book vouchers to three randomly selected participants. Questionnaires were hand-delivered to the three physiotherapy departments in the Western Cape Province, and posted to the departments in other provinces.

Questionnaires and cover letters explaining the study were sent to class co-ordinators in each physiotherapy department, which they distributed to their respective classes. Students were asked to complete the questionnaires and return them to the researcher by post. Data were captured and coded using the OpenOffice spreadsheet application and descriptive and inferential statistical analysis was performed using the Statistical Package for Social Science (SPSS), version 16. Statistical significance was set at p equal to or less than 0.05.

Ethical clearance to conduct the study was obtained from the University of the Western Cape, and permission obtained from the heads of each physiotherapy department who agreed to participate. Consent was implied by completing and returning the questionnaire and anonymity was ensured by not collecting personally identifiable data. Class co-ordinators were asked to inform students that participation was voluntary and that their anonymity would be ensured by not gathering any personally identifiable information. There were no risks in participating in the study.

Results

The demographic data of the participants are presented in Table 1, with 529 respondents representing a response rate of 48%.[1] Eighty two percent of respondents were female, 41 % were White and more than half (51%) were between 16 and 20 years old.

Most participants (92%) reported using ICT at university, with 74% using it at least weekly. There was a significant relationship between race and the frequency of ICT use at university (p=0.000), with Black students being the most frequent users (91% using it at least weekly), then Coloured and Indian students (79% and 77% respectively) and White students using ICT the least (61% at least weekly). It was also found that the university attended was a

significant factor in the frequency of ICT use (p=0.000), as shown in Figure 1. Few Black students reported having access to the Internet when they were in high school (18%) and at home (15%), prior to attending university, which is in stark contrast to the 60% of White students who had Internet access at high school, and 78% who had access at home.

Table 2 indicates that using online search engines was the most common use of the Internet at university (85%), and accessing the departmental website the least common use. The use of online databases (53%) and journals (48%) was found to be low. The use of email while at university was also reported to be low (48%), with only 26% of these respondents reporting using it to communicate with their peers and lecturers (not shown in Table 2). There was a significant relationship between the activities performed online (see Table 2) and the university attended (p=0.000). The most common reason given for using the Internet at university was to prepare assignments (83%), which was followed by academic development (43%). The least common reason was to seek clinical advice or guidance (23%). Forty eight percent of students used the Internet at university for personal interest.

Table 3 shows that most physiotherapy students (>70%) reported that they were confident in performing searches on the Internet, sending email, printing documents, writing letters or records, preparing presentations and for professional development. Research, gaming, forum discussion and exercise prescription are the activities that physiotherapy students reported being uncertain or not confident in performing. Additionally (not shown in table), most respondents indicated a preference for face-to-face contact (95%), rather than email (25%), as the means by which they access support.

Students also reported that they believed that ICT would be beneficial in their clinical practice, including making administrative tasks and communication easier (95% and 87% respectively), improving the level of support they receive (70%) and that improved support would positively influence their decision to work in a community post (78%).

Discussion

The issue of race must clearly be addressed when considering the use of ICT within university physiotherapy departments, with most Black students having access to ICT resources for the first time on entering university. Black physiotherapy students are therefore disadvantaged from the very outset of their studies, which leads to uncomfortable questions about the possibility of student performance being racially differentiated if physiotherapy departments begin using ICT tools more frequently as part of the curriculum. This lack of access and equity in South African higher education was highlighted by Scott et al (2007) and confirms that much work is still to be done by higher education institutions, beginning with a need to quickly identify students who require extra support in order to make the most of ICT resources during their physiotherapy education.

Respondents indicated a preference face-to-face contact as the means by which support could be accessed, which was in agreement with Rohleder et al (2007) who found a similar preference for face-to-face interaction between students and staff in higher education. When considered alongside the findings by Stiller et al (2007), who reported that Australian physiotherapists would prefer a model for clinical education that encouraged more, not less, face-to-face contact time, it seems that ICT should not be used to reduce face-to-face contact time, as has been suggested by Eksteen (2005).

Most students reported using the Internet to find information for assignments and projects, and this was the most common use of ICT at university by a margin of more than 20%, which is in agreement with at least one UK-based study (Devitt & Murphy, 2004). The fact that students are using the Internet to find information should be seen as a positive step towards self-directed learning. However, while students may be comfortable with finding information online, there was no indication of the quality or credibility of this information. When considered together with the reported low use of email at university, this suggests that South African physiotherapy students use ICT primarily as a means of finding information, rather than as a means of communication. Despite this low reported use, most students indicated that ICT can improve communication between lecturers and peers and felt confident to use it. While email has been shown to be a reliable, efficient and cost-effective means of communication, South African physiotherapy students do not use it as part of their studies, losing out on the potential of enhanced levels of engagement with each other and their lecturers.

Although most students agreed that ICT could improve the level of support they receive, very few respondents reported using ICT tools to seek advice or guidance. This finding is in contrast to the literature, which has identified ICT as offering a means of both improving communication and peer support (Johns, 2003; Rohleder et al, 2007; Mitchell et al, 2001). This highlights the potential to improve this aspect of communication between lecturers and students. This suggests that while South African physiotherapy students are aware of the potential of ICT to improve the support they receive, they do not actually use it. While it was beyond the scope of this study to investigate reasons for this, it may be that students only use the channels of communication that are available to them.

It is a concern that research was highlighted as the area in which more than a third of students were either "Uncertain" or "Not confident". However, even though 83% of students reported feeling confident using the Internet to perform online searches, they did not make the connection between using the Internet to find information for assignments and using the same techniques to inform their education and practice through research. With a move towards self-directed learning practices in undergraduate education (Oblinger & Oblinger, 2005), students may not have the insight to use the skills they possess to more effectively learn.

The university attended was found to be a significant factor in the frequency and reasons for ICT use, with respondents at two particular universities using ICT resources more often and for a greater number of activities than respondents at other universities. This suggests that the university a student attends will influence both the frequency of ICT use and the activities they use it for. Thus, it seems clear that the role of the university is important both in terms of providing access to technology, as well as in better preparing students for it's use. Two particular areas should be highlighted. With the evidence indicating that students' use of ICT is focused on online search, universities should take measures to ensure that they are able to differentiate between high quality, credible information on the internet, and poor quality articles. The other area in which there is potential for improvement, is in communication, with universities opening up further channels for communication between students and lecturers.

The results of this survey indicate that while South African physiotherapy students are aware of the potential benefits of using ICT as part of their studies, they do not always make the best use of them. The reasons for this discrepancy were not within the scope of this study, but may include the fact that not all institutions or departments facilitate or require students to

use ICT resources. With the move towards the provision of physiotherapy community-based health services in rural areas where professional support may be lacking, certain groups of South African physiotherapy students may be disadvantaged with it comes to the use of ICT in these environments. As a result of poor access to ICT prior to attending university, Black South African physiotherapy students in particular may struggle to take advantage of the benefits of ICT as a means of improving communication and accessing support. While Coloured and Indian students also reported reduced access to computers and the Internet prior to attending university, this was not as high as Black students.

Conclusion and recommendations

The use of ICT has been shown to be a feasible means of improving the professional education and support of physiotherapy students, mainly through improved communication and greater access to information. However, it is recognised that a shift to an ICT-enabled physiotherapy curriculum will bring with it several challenges, not least of which is the issue of racial differentiation in access and equity prior to attending university. The implications of this for South African physiotherapy education is significant, in that more attention must be paid to the needs of certain groups of students and the input they require, especially when using ICT resources. It was also shown that most South African physiotherapy students use ICT as a means of gathering information, rather than to obtain support through improved communication with educators, clinicians and their peers.

It is recommended that physiotherapy departments at universities should develop and implement a comprehensive ICT strategy, focusing on the use of ICT to improve communication between students and lecturers. However, educators must be aware of the differences in ICT experience between some groups of students and adapt their teaching strategies accordingly. They must take cognisance of the fact that not all students have had the same advantages prior to entering university and that their teaching methodology cannot assume an even distribution of ICT experience. Educators should also aim to link the ICT skills that students already possess, to activities related to their education and professional practice. Finally, universities must provide ongoing training for staff and students to make effective use of emerging technologies to enhance teaching and learning practice.

Reference list

African National Congress 1994 A National Health Plan for South Africa. Retrieved June 16, 2006, from http://www.anc.org.za/ancdocs/policy/health.htm

Barnes K, Marateo R & Ferris S 2007 Teaching and learning with the net generation. *Innovate* 3. Retrieved 24/04/08 from http://www.innovateonline.info/index.php?view=article&id=382

Boulos MNK, Maramba I & Wheeler S 2006 Wikis, blogs and podcasts: a new generation of Web-based tools for virtual collaborative clinical practice and education. *BioMed Central Medical Education* 6:41

Bozalek V, Rohleder P, Carolissen R, Leibowitz B, Nicholls L & Swartz L 2007 Students Learning across Differences in a Multi-disciplinary Virtual Learning Community. *South African Journal of Higher Education* 21(7):810-823

Department of Education, South Africa 2004 Draft White Paper on e-Education: Transforming learning and teaching through information and communication technologies (ICT). *Government Gazette* 470

Devitt N, & Murphy J 2004. A survey of the information management and technology training needs of doctors in an acute NHS trust in the United Kingdom. *Health Information and Libraries Journal* 21:164-172

Eksteen C 2005 The role of e-Learning in Physiotherapy education. Oral presentation at the International Physiotherapy Conference, Johannesburg, South Africa

Greenhalgh T 2001 Computer assisted learning in undergraduate medical education. *British Medical Journal* 322:40-44

Grimmer-Somers K, Lekkas P, Nyland L, Young A & Kumar S 2007 Perspectives on research evidence and clinical practice: a survey of Australian physiotherapists. *Physiotherapy Research International* 12:147-161

Hill P & Alexander T 1996 Continuing professional education: A challenge for rural health practitioners. *The Australian Journal of Rural Health* 4:275-279

Johns R 2003 Application of web-based learning in teaching social work law. *Social Work Education* 22:429-443

Kingsley K & Kingsley KV 2009 A case study for teaching information literacy skills. *BioMed Central Medical Education* 9:7. Available at http://www.biomedcentral.com/1472-6920/9/7

Louw JA & Hanmer L 2002 Implications of the information revolution for economic development in South Africa. Department of Trade and Industry Policy Support Programme Management Unit , Cnr. Fehrsen & Bronkhorst Str., New Mucleneuck, Pretoria, South Africa Martin R 2007 Online education and training: well-founded pedagogy or state-corporate interests? *South African Journal of Higher Education* 21:473-484

Mitchell JG, Robinson PJ, McEvoy M & Gates J 2001 Telemedicine for the delivery of professional development for health, education and welfare professionals in two remote mining towns. *Journal of Telemedicine and Telecare* 7:174-180

National Health Service 1998 Information for health: an information strategy for the modern NHS 1998-2005. National Health Service Executive, Department of Health, London

Oblinger DG & Oblinger JL (eds) 2005 Educating the Net Generation. *Educause.* Retrieved 17/11/08 from http://www.educause.edu/educatingthenetgen/

Rohleder P, Bozalek V, Carolissen R, Leibowitz B & Swartz L 2007 Students' evaluations of the use of e-learning in a collaborative project between two South African universities. *Higher Education* 56(1):95-107. Springer Netherlands

Rowe, M 2008 Information and communication technology in health: a review of the literature. *Journal of Community and Health Science* 3(1):68-77

Samuel M, Coombes JC, Miranda JJ, Melvin R, Young EJW & Azarmina P 2004 Assessing computer skills in Tanzanian medical students: an elective experience. *BioMed Central Public Health* 4:37

Scott I, Yeld N & Hendry J 2007 A Case for Improving Teaching and Learning in South African Higher Education. Volume 6. The Council on Higher Education, Didacta Building, 211 Skinner Street, Pretoria, South Africa. Retrieved 09 March, 2009 from http://www.che.ac.za/documents/d000155/

Stiller K, Lynch E, Phillips AC & Lambert P 2004 Clinical education of physiotherapy students in Australia: Perceptions of current models. *Australian Journal of Physiotherapy* 50:243-247

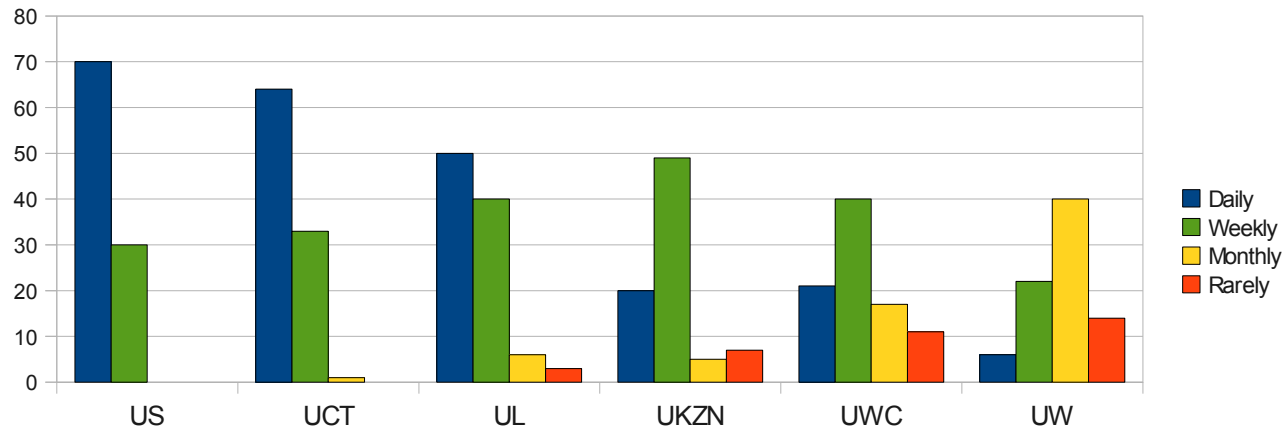
Taylor R & Lee H 2005 Occupational therapists' perception of usage of information and communication technology (ICT) in Western Australia and the association of availability of ICT on recruitment and retention of therapists working in rural areas. *Australian Occupational Therapy Journal* 52:51-56

Table 1: Demographic data of respondents (N=529)

Variable	n	%
Gender		
Female	432	81.7
Male	97	18.3
Age		
16-20	270	51
20-25	244	46.1
26-30	11	2.1
31-35	2	0.4
35-40	2	0.4
*Race**		
Black	117	22.1
Coloured	126	23.8
Indian	64	12.1
White	219	41.4

** The use of racial categories recognises the socio-economic impact of the policy of apartheid prior to 1994. The categories used in this study were based on the government's racial classification system during that time. In the past, population group was based on a legal definition, but it is now based on self-perception and self-classification. Coloured in this context is a population of mixed ancestry.*

Figure 1: Frequency of ICT use at university (N=529)



US – University of Stellenbosch
UCT – University of Cape Town
UL – University of Limpopo
UKZN - University of Kwazulu-Natal
UWC – University of the Western Cape
UW – University of the Witwatersrand

Table 2: Physiotherapy students' use of the Internet at university (N=529)

Online activities	n	%
Online search engines	447	84.5
Online library	332	62.8
Physiotherapy-related websites	322	60.9
Online databases	280	52.9
Online journals	255	48.2
Course-related email	252	47.6
Department websites	217	41

Table 3: Physiotherapy students' reported confidence in using ICT (N=529)

Activity	Confident		Uncertain		Not confident	
	n	%	n	%	n	%
Internet search	441	83.4	21	4	10	1.9
Email	438	82.3	17	3.2	6	1.1
Printing documents	412	77.9	26	4.9	11	2.1
Writing letters/records	381	72	33	6.2	24	4.5
Preparing presentations	380	71.8	60	11.3	15	2.8
Professional development	376	71.1	69	13	18	3.4
Research	227	42.9	145	27.4	47	8.9
Games	225	42.5	44	8.3	14	2.6
Forum discussion	180	34	75	14.2	35	6.6
Exercise prescription	121	22.9	150	28.4	33	6.2

Discrepancies in percentage totals are a result of missing data