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Surfing or still drowning? Student nurses' Internet skills

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SUMMARY

A study into student nurses' ability to use the Internet was published in Nurse Education Today in 2004. This paper repeats the research with a cohort of students starting their pre-registration programme in a UK university in 2007.

In 2004 students were reported as having poor Internet skills, and as not being frequent users of the Internet. In this study students were found to have significantly better ability to carry out basic tasks and significantly higher levels of Internet use. Their ability to apply these skills to more complex information literacy tasks however had not increased, with more than half of all students saying they found far too much irrelevant information when searching for specific information on the Internet. The earlier study found that skills and age were not related, which appears to still be the case.

The need for these skills is increasing as education, lifelong learning, and patient information are all increasingly drawing on the developing Internet. Nurse education however is not integrating the skill and knowledge base essential to support this into pre-registration programmes, and the evidence suggests that this will not happen without active management.

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Introduction

In 2004 Nurse Education Today published a paper I had written discussing student nurses' Internet skills (Bond 2004). That paper studied a cohort of students who started their pre-registration education in 2001–2002. This paper updates that research, and compares the earlier study with a cohort of students who started their pre-registration nurse education in the 2007–2008 academic year. In addition to updating the research, literature published since 2004 has been used to update the background to the study.

The 2004 paper explained that students needed to be able to use the Internet to support both their studies and their practice. In the intervening period the case for nurses needing the skills and knowledge to use the Internet has not changed. The developments discussed and anticipated are being seen in practice. The evidence suggests this is not going to change. Information technology and the Internet are both becoming ubiquitous in most developed countries. In the UK in 2001/2002 50% of households had a computer, and 40% an Internet connection (ONS, 2003). By 2007 this had risen to 70% of households having a computer and 61% an Internet connection (ONS, 2008).

Background

The educational context

The ability to use Information and Technology is becoming a pervasive need in nurse education. Burrows (2006) argues that health libraries were early adopters of electronic journals, and that their users were happy to embrace their use. A study of an academic health science centre (De Groote and Dorsch, 2003), found that 71% of users of a health science library preferred online to print journals.

An increasing amount of education is delivered by, or mediated through, online means. Students accept the use of Virtual Learning Environments (VLE) (Green et al., 2006; Wright, 2005), however some limitations have been found. Farrell et al. (2007) found that although student nurses were happy to participate in an online unit in clinical communication having a computer at home, rather than having to rely on university equipment, not only made this easier, but also have a positive effect on their grade. Although satisfaction with online delivery was high, students did not find the online interaction to be a satisfactory substitute for face to face interaction.

In a study looking into whether e-learning or traditional lectures were the more effective mode of delivery for teaching nursing students' about infection control. Reime et al. (2008) concluded that, although students were satisfied with both delivery modes, when using e-learning it was essential that students were competent in the use of computers. A similar conclusion

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was reached by Jonas and Burns (in press), who found that some nurses in their study into the transition to a blended learning approach for a pain management module did not have sufficient computer expertise.

Health care context

In the 2004 paper four ways that the UK Health Service (NHS) was seeking to use information technologies to improve patient care were identified. These were

- Ensuring that professional staff have access to up to date information on which to base their practice.
- Speeding up, and easing, access to services for patients.
- Improving communication flows of essential patient information.
- Ensuring that patients and carers are informed about the NHS and best practice in relation to their condition.

The argument was also put that with the development of the Internet there was no longer the need for a professional information gatekeeper, and that nurses would need to become facilitators, helping patients to evaluate information they have found. More recently Gilmour (2007) supports this argument, saying that in order to adequately support patients and their families nurses need to be experts in using online health information.In 2009 Sir Muir Gray, the NHS Chief Knowledge Officer, concurred with this, putting patients in the driving seat saying

> "In the past we've given knowledge to clinicians who've then passed it onto patients, now our principles are that we give knowledge to patients and give them the opportunity to discuss it with clinicians" (CFH, 2009 p24).

Connecting for Health (CFH, 2009) identify that nurses are going to need the skills and knowledge to enable them to work effectively, and within information governance standards, with a range of technologies and web based resources.

In spite of the evidence for this to be a developing, and continued, need for nurses' research has shown that progress is slow. Scott et al. (2008), in a study of New Zealand undergraduate student nurses, found that few explored patients' use of the Internet, and even fewer helped patients to evaluate information they had accessed from the Internet. They argue that all nursing students need to develop competence in information literacy, in addition to computer skills. An American study (McNeil et al., 2006) in a review of the content of undergraduate nursing programmes found that the majority placed the emphasis on computer skills rather than informatics literacy. They also found that faculty often conflated information literacy and computer literacy.

The study

A questionnaire based survey of the cohort of nursing students starting their pre-registration programme in the 2007–2008 academic year in a university in the South of England was undertaken. Questionnaires were chosen as the tool of choice for practical and ethical reasons. Practically, it allowed the whole cohort to participate. Ethically, as the primary researcher was an academic within the department it allowed students to participate anonymously. Ethical review was discussed with the school's ethics review panel chair, and the research was agreed as part of programme evaluation. In order to ensure that students did not feel pressurised into participating questionnaires were handed out in the first lecture, and students asked to return the questionnaires folded, giving them the option that if they did not wish to participate they could return a folded, blank, form and no-one would know.

The questionnaires explored the use that students had made of the Internet in the 3 months prior to starting their programme, their perceptions of their skill levels and their ability to carry out some basic tasks:

- Enter a web address in a browser.
- Send and receive emails.
- Use a search engine to find information on the World Wide Web (web).

Students were also asked to rate their skills in using the Internet, with the categories of 'excellent'; 'good'; 'basic'; and 'not used' being offered. Skills were further explored by asking students whether they could carry out a range of tasks 'without any problems'. These tasks were all drawn from the European Computer Driving Licence (ECDL), a basic IT qualification. Testing students on their skills to obtain a more objective measure was considered, but was rejected as being neither practical nor ethical.

The questionnaire then asked about Internet use through the use of a four point Likert type scale, asking students to respond to three statements on a scale of strongly agree to strongly disagree.

- I often use email to communicate with friends.
- I end up with far too much irrelevant information when I try to find things on the Internet.
- I enjoy surfing the WWW.

The final section asked about some demographic information, and about students' computer ownership and Internet connection.

The questions were kept the same as those asked of the 2001–2002 students to enable comparisons to be made. The results are presented in the same order as the results in the 2004 paper as far as practicable, and the earlier results discussed alongside.

Results

In total 386 students returned a completed questionnaire, this is a small increase over the 317 who completed one in 2001–2002. In both cases this is 100% of the students who attended the initial induction session.

Although there is no significant difference in the gender of the students between the two studies (in 2007 92% of respondents were female) there was a significant age difference (chi square 10.788 $p = 0.005$) (Chart 1).

Nearly all the students (97.9%, $n = 378$) had a computer, only 2.6% ($n = 10$) did not have access to one all year, being limited to access at either their home or their term time address. Only 2.1% ($n = 8$) did not have any computer access. This is an increase in ownership, with 83.9% having a computer in the earlier study, and 5% having no access. 12.3% (2001) had access part of the year. Only 7.5% ($n = 27$) did not also have an Internet connection, this is a slight decrease from 2001 when 10% did not.

Use of the web in the 3 months prior to the course increased significantly over the period (chi square 204.161, $p < .001$). 92.2% ($n = 356$) had used the web at least weekly, only 0.3% ($n = 1$) had not used it at all. In 2001 less than half of students (45%) used the web weekly and 24.2% hadn't used it at all. In 2001 the use of email was noted to be very similar to use of the web, this remains true in 2007 (Chart 2).

There was a significant difference in confidence in web skills between the two cohorts (chi square 157.915 $p < .001$). In 2001 14.5% ($n = 48$) said they had never used the web, only 0.5% ($n = 2$) said

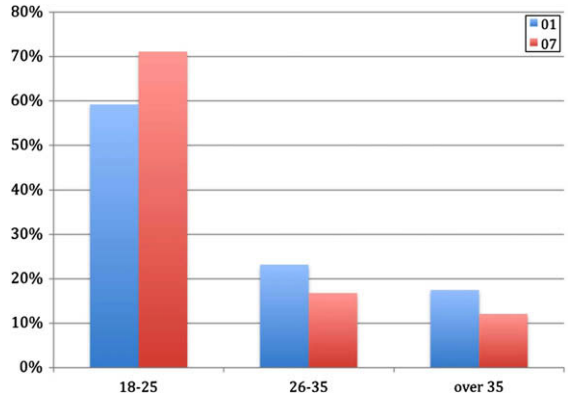

Chart 1. Age difference.

this in 2007. 19.4% ($n = 75$) considered themselves to be expert, compared to 4.9% in 2001, whilst the number who classed their skills as basic fell from 56.6% in 2001 to 11.4% ($n = 44$) in 2007. In 2007 96.4% ($n = 373$) agreed with the statement 'I enjoy surfing the web, 3.6% ($n = 14$) disagreed, in 2001 15.7% said they disagreed.

In 2007 very few students (3.4% $n = 13$) did not agree with the statement 'I enjoy surfing the web'. The likelihood of disagreeing increased as skills decreased, 9.1% of those with basic skills disagreed, as did 3.4% of those with good skills, and none of those who said they were experts. In 2001 72.3% of those with basic skills enjoyed surfing the web, this had increased to 90.9% ($n = 40$) in 2007, supporting the 2001 observation that good skill levels were not required for enjoyment.

Increases in the ability to carry out basic tasks were found. 93.3% ($n = 362$) said they could enter an address in a web browser in 2007, compared to 62.5% in 2001 (chi square 101.557 $p < 0.001$). A similar increase was seen in students saying they could use a search engine, with 94.3% ($n = 366$) compared to 62.8% saying they could in 2001. Overall 54.4% ($n = 211$) of 2007 students agreed that they 'end up with far too much irrelevant information when trying to find specific information on the Internet', compared to 60.15% agreeing in the original survey. The difference in answers to this question between the two surveys was not statistically significant. There was however an increase in students who thought they had expert Internet skills agreeing with the statement. In 2001 30.8% of 'experts' agreed with the statement, whilst in 2007 this had increased to 40%. As can be seen in Table 1 however, the number of students who assessed themselves as having good skills who also agreed with the statement remained almost unchanged.

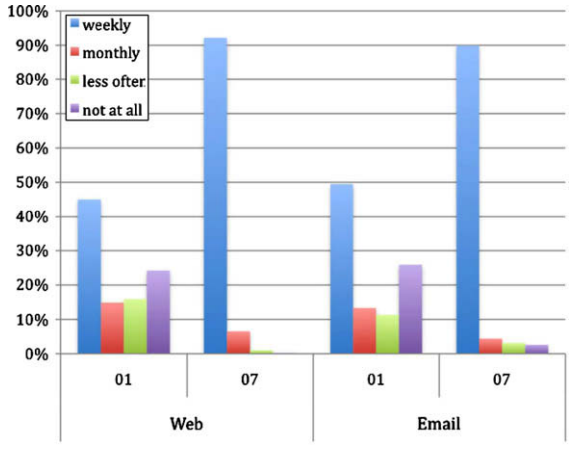

Chart 2. Internet use 2001 and 2007.

Table 1
Students agreeing they end up with far too much irrelevant information when searching online.

	Original	Repeat
Self assessed Internet skills and agreeing with the statement		
Expert	30.8%	40%
Good	54.4%	53.4%
Basic	68.8%	84.1%

Table 2
Summary of key comparisons.

	Original	Repeat
Number completed	317	386
Computer access	83.9%	97.9%
Use of the web in the 3 months prior to enrolment		
Weekly	45%	92.2%
None	24.2%	0.3%
Never used the web	14.5%	0.5%
Self assessment of Internet skills		
Expert	4.9%	19.4%
Basic	56.6%	11.4%
Able to enter an address in a web browser	62.5%	93.3%
Able to use a search engine	62.8%	94.3%
Agree with statement 'I end up with far too much irrelevant information searching online	60.1%	54.4%
Able to use a search engine and agrees with statement above	61.5%	53%

The 2007 survey included an additional question not asked in 2001. Students were asked if they could virus check an email attachment. Less then half (47.2% $n = 183$) said that they could. Amongst those who considered their Internet skills to be 'expert' the number was 70.7%, leaving just over one third of 'experts' unable to. No relationship was found between the ability to carry out a virus check and students' age.

In 2001 no relationship had been found between age and ability to carry out tasks. The results were less conclusive in 2007. The very low numbers of students saying they used the web and email less than monthly (5 students) made the chi square calculation unreliable. Although fewer students in the over 35 age group (80.9%, $n = 38$) could enter a web address in a browser than in the 18–25 group (97.1%, $n = 267$) this result was again unreliable because of small numbers in the 'not able to' classification.

The only cross-tabulation here to have a reliable chi square calculation was that exploring the relationship between age and the statement 'I end up with far too much irrelevant information when trying to find specific information on the Internet', where no statistically significant relationship was found.

A summary of main comparisons is given in Table 2 below.

Discussion

Students' use of the Internet prior to starting their course increased significantly between the two studies. It is now very unusual for students not to have experience of using the Internet, and a significant majority feel able to carry out basic tasks, including entering a web address in a browser and using a search engine.

In spite of the increase in these basic, technical, skills there was an increase in students saying they had problems with the amount of irrelevant information they find when searching for information. This suggests that whilst the ability to use a search engine has increased knowledge about effective searching has not improved over the period. Even though almost all students could send email less than half could carry out a virus check on an email attachment,

an essential skill to protect the integrity of computer systems, a part of information governance.

Other studies have reached similar conclusions. Two studies of American students' IT fluency (Kaminski et al., 2009) carried out in 2001 and 2005 found that whilst there was an increase in skills using common software applications (e.g. Word processing) they concluded that students were not developing knowledge of more advanced computer uses, such as communication and information sharing. The same has been noticed in schoolchildren (Kuiper et al., 2009) who were found to have good technical web skills, but not the information literacy to be able to use them effectively.

The need for nursing students to have good Internet skills is increasing as the use of the Internet grows. In 2004 (Bond, 2004) it was noted that the increased use computers in nurse education was not universally supported. Their use however has continued, some would argue increased, and will continue to do so for the foreseeable future. Students need to be able to work confidently with online learning resources as they will be expected to do so when they are qualified. The NHS anticipates greater use of a wider range of web resources to support staff learning needs (Purdy, 2009; Jonas and Burns, in press).

Nurses also need to be able to work confidently with patients in meeting their information needs. This not only includes working with a rapidly developing range of web based resources but also with the developing e-health agenda.

The need for nurses to develop both practical skills, and a knowledge base to enable the effective use of those skills, is stressed by Bond and Procter (2009). This research however suggests that whilst nursing students may now be starting their pre-registration programme with at least adequate skills, they do not have the knowledge base to apply those skills effectively.

A study across faculties at a major UK University (Weetman, 2005) found that faculty considered the development of information literacy to be important, and anticipated that students would have developed this during their degree programme. The lack of any structured way of ensuring this was achieved was also found, with faculty expecting students to 'pick it up' via what the authors, somewhat cynically, called the 'osmosis technique'.

Within nursing both computer literacy and information literacy are seen as being fundamental to nursing informatics (Nelson and Staggers, 2008). Nurse education however also seems to expect students to acquire these skills and knowledge by osmosis. Nurse education has been found to be slow at integrating this into pre-registration education. A study in the United States (McNeil et al., 2005) found that only half of undergraduate nursing programmes included information literacy skills.

Conclusion

The need identified in 2004 for nurses to have the skills and knowledge to work with the increasing amount of information, and information technology, has increased in the intervening period. Developments in the Internet are making it a tool of choice for a lot of patients, and more reliance is being placed on its use in education and training.

In spite of this even though an increase in basic skills has been found between the two studies the ability to carry out more complex tasks has not. The reason for this has not been identified, and is certainly worthy of further study. Whatever the reason it needs to be addressed in nurse education, as the development of information literacy has been shown to need to be actively managed not left to chance, or osmosis.

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