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The Transferability of Information and Communication Technology Skills from University to the Workplace: A Qualitative Descriptive Study

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ABSTRACT

Aim

This paper presents the findings from a study that explored whether the information and communication technology (ICT) skills nurses acquired at university are relevant and transferable to contemporary practice environments.

Background

Whilst universities have attempted to integrate information and communication technology into nursing curricula it is not known whether the skills developed for educational purposes are relevant or transferable to clinical contexts.

Methods

A qualitative descriptive study was used to explore the perspectives of a small group of new graduate nurses working in a regional/semi-metropolitan healthcare facility in New South Wales, Australia. Semi-structured interviews were used and the data thematically analysed.

Findings

The themes that emerged from the study are presented in accordance with the conceptual framework and structured under the three headings of pre-transfer, transition and post-transfer. The transferability of information and communication technology skills from university to the workplace is impacted by a range of educational, individual, organisational and contextual factors.

Conclusion

Access to adequate ICT and the necessary training opportunities influences new graduates' work satisfaction and their future employment decisions. The ability to effectively use information and communication technology was viewed as essential to the provision of quality patient care.

Keywords

New graduate nurse, information and communication technology, transferability

INTRODUCTION

For many new graduate nurses access to and ability to use information and communication technology (ICT) is considered essential for working in contemporary healthcare contexts and for the provision of quality patient care. For these nurses ICT is simply a 'tool of the trade' (Sandelowski, 2002) and provision of adequate healthcare technologies and related training opportunities influences their work satisfaction and employment decisions.

Whilst universities have attempted to integrate ICT into nursing curricula (Simpson, 1998) it is not known whether ICT adopted for educational purposes is relevant to contemporary nursing practice. There is a need to examine the transferability of ICT skills acquired at university to contemporary practice environments. There is also a need for research into the experiences of new graduate nurses using ICT in the workplace, with particular attention to the relevance and transferability of university learned ICT skills.

This paper presents the findings from a qualitative study that sought to explore the perspectives of a small group of new graduate nurses working in a regional/semi-metropolitan healthcare facility in New South Wales, Australia. A conceptual framework was derived from the literature and provides a theoretical basis and a schematic view of the themes that emerged from the study.

BACKGROUND

In this study the term ICT refers to any electronic equipment that accumulates, retrieves, controls, accepts or manipulates information in order to support practice and delivery of nursing care (Graves & Corcoran, 2007, p. 277).

Nurses' ICT Skills

In order for nurses to work with computer-based systems and support patient care effectively they require the skills and knowledge to use ICT efficiently. However, some studies suggest that nurses have poor ICT skills (Bond, 2004; Griffiths & Riddington, 2001) and that they are sometimes resistant to the use of ICT (Timmins, 2003). A cross-sectional survey of 479 healthcare professionals from two hospitals in New South Wales, Australia found that nurses were more wary of using computers than other healthcare staff and made more negative statements, for example, *I avoid using computers whenever I can*, and *I feel uncomfortable about*

the thought of using computers (Kirshbaum, 2004). This study also identified that of the 234 nurse/midwife participants, 81 had never used computers and 80 were not confident in their use. In contrast, a postal survey of 4300 nurses across Australia, 91 per cent of whom had more than five years nursing experience, found that 90 per cent of the participants considered computer knowledge essential for nurses and 73 per cent described themselves as confident or very confident in computer use (Hegney et al., 2006). However, further results from the same research project reported that almost half of the respondents believed that they required more training to better meet the ICT requirements of their jobs (Eley, Fallon, Soar, Buikstra, & Hegney, 2008). The study identified that spreadsheets, databases and patient management systems were the most frequently accessed applications, required the most post registration training, and received the least amount of pre-registration training.

ICT and Patient Outcomes

Appropriately used, ICT can have a positive impact on patient outcomes by reducing the number of adverse events and improving the quality, safety and efficiency of clinical processes (Staggers, Gassert, & Curran, 2002). In a study by Smith, Banner, Lozano, Olney and Friedman (2009) ICT was found to increase patient safety by significantly reducing the vital sign documentation error rate in a 20-bed cardiac ward (p. 321). ICT has been shown by Devore, Berrong and Clark (2007) to increase patient satisfaction and reduce medication errors. Kossman and Scheidenhelm (2008), in a mixed method study of 46 nurses in two locations found that ICT prevented inadvertent errors. However, in this study the quality of patient care decreased as less time was spent at the bedside which resulted in a perceived loss of personalised patient care. While the effective use of ICT has the potential to improve patient outcomes (Staggers et al., 2002) research also suggests that ICT use in nursing practice may be in opposition to the art of nursing and humanised health care.

Technology versus Humanised Care

Research demonstrates that nurses cannot use ICT without, to some degree, being influenced by its use (McConnell, 1998). The accumulation of equipment (for example, vital sign monitors, intravenous fluid pumps, cardiac monitors, telephones and computers) in clinical areas is said to engage nurses in a co-dependent relationship that places demands on both the nurse and technology (McConnell, 1998). The growth of ICT in modern nursing continues to change nursing functions and provides the potential and challenge for the expansion of the nursing role (Bath, 2008). However, Adams (1986) proposed that If nurses endeavor to overcome the barriers that technology presents to touch and meaningful human interactions the patient's psychosocial needs may be met. More recently ICT has begun to be regarded by experienced

nurses as 'tools of the trade' and a way to enhance the quality of patient care and reduce adverse events (Sandelowski, 2002).

ICT Education in Nursing Programs

Although there is no consensus on what ICT skills need to be taught at university (McCannon & O'Neal, 2003), there have been a numerous attempts to establish a body of knowledge regarding the ICT skills taught at university and the position of ICT education within curricula. Internationally there are claims that although nursing students gain knowledge of ICT at university, the skills they gain are inconsistent and not always transferable or applicable to clinical practice (Ip, Jones, & Jacobs, 2007). In the United Kingdom a study by Bond (2009) found that nursing students were willing to use computers and understood the benefits to the nursing profession. However they were unaware of the ICT skills required by qualified nurses in practice. In the United States Fetter (2009) reported that graduating baccalaureate nurses had average ICT skills. The students were most confident in using the Internet, word processing and systems operations skills. The students rated themselves lowest on care documentation and planning, valuing informatics knowledge, skills development, and data entry competencies.

New Graduate Nurses and ICT Transferability

New graduate nurses embark upon a journey into an unquestionably technological arena and it is reasonable to expect that their university experiences should help to prepare them for the demands of contemporary healthcare settings (Ellis & Hartley, 2001). Universities have taken major steps to transform their curricula to incorporate ICT and to make use of the variety of educational technologies available to facilitate learning (Francis, Bowman, & Redgrave, 2001). There is a wide range of literature in relation to ICT in nursing education (Carlile & Sefton, 1998; Conrick, 2006; Ellis & Hartley, 2001) yet there is relatively little relating to the transferability of ICT skills to the workplace environment. In order to teach the required skills, universities need to have a clear understanding of those ICT skills graduates need in order to be work ready (McCannon & O'Neal, 2003). Currently, most of the literature tends to focus on attitudes and confidence towards computer and information literacy skills (Grain, 2005; Halfer D & Graf, 2006; McNamara, 2003).

AIM OF THE STUDY

The aim of this study was to answer the following research questions from the perspective of graduate nurses:

- Are the university acquired ICT skills of graduate nurses transferable to the workplace?
- What factors facilitate and impede the transferability of ICT skills from university to the workplace?
- What are the consequences of ICT utilisation for patients and for new graduate nurses?

CONTEXT OF THE STUDY

This study was conducted in a regional/semi-metropolitan coastal area of NSW. This region has a population nearly 300,000 (Health Services Planning Unit, 2008). Two acute hospitals, two sub-acute facilities, ten community health facilities and a number of non-government organisations comprise the major health service in this area (Health Services Planning Unit, 2008). In 2008, 86 graduate nurses commenced employment in this area health service (Brown, personal communication, 2009).

RESEARCH PARTICIPANTS

Following ethics approval, graduate nurses who met the inclusion criteria were invited to participate in the study. Purposive sampling using specific inclusion criteria was used to select participants from diverse clinical areas.

Inclusion Criteria

The study required graduate nurses from a broad range of clinical specialty areas who spoke English and who worked at least 24 hours per week.

Exclusion Criteria

The study excluded graduates who worked less than 24 hours per week. This ensured that participants had adequate clinical experience and could speak with authority about their use of ICT in the workplace.

A sample of eight new graduate nurses was recruited for the semi-structured interviews. This number provided a diverse range of data, enabled a depth of data collection and maximised the quality of the data generated. Potential participants received a written invitation from the Nurse Educator, Organisation and Learning. Interested graduates were advised to contact the

researcher by e-mail or phone. Those who expressed an interest were sent an information statement and asked to sign a consent form.

Six of the participants were female and two were male. Participants' ages ranged from 21-47 years. Five of the participants had completed their Bachelor of Nursing at a semi metropolitan/regional university, one in a metropolitan university and two participants completed their Bachelor of Nursing through distance education. Three of the participants had prior nursing experience as either Enrolled Nurses or Endorsed Enrolled Nurses, two as Assistants in Nursing. The remaining three participants had no prior nursing experience. The participants were working in a range of clinical settings with one in the emergency department, two in surgical wards, three in medical wards, one in community and one in a cardiac ward.

DATA COLLECTION

Data was gathered via semi-structured in-depth audio taped interviews. Miller and Crabtree (Crabtree, 1999, p. 19) describe semi-structured interviews as guided, concentrated, focused and open-ended communication events that are co-created by the researcher and interviewees and occur outside the stream of everyday life. Semi-structured interviews were used to allow the participants a degree of freedom to express their views, to allow a depth of description and to openly explore the topic. The open-ended questions included:

Were the ICT skills you acquired at university transferable to your workplace?

What factors have facilitated the transferability of your ICT skills from university to the workplace?

What factors have impeded the transferability of your ICT skills from university to the workplace?

What ICT skills do you need to practice effectively in your work?

Can you describe the specific ICT skills that you have needed to learn since commencing your graduate program?

In what way, do you believe that the effective use of ICT impacts patient outcomes?

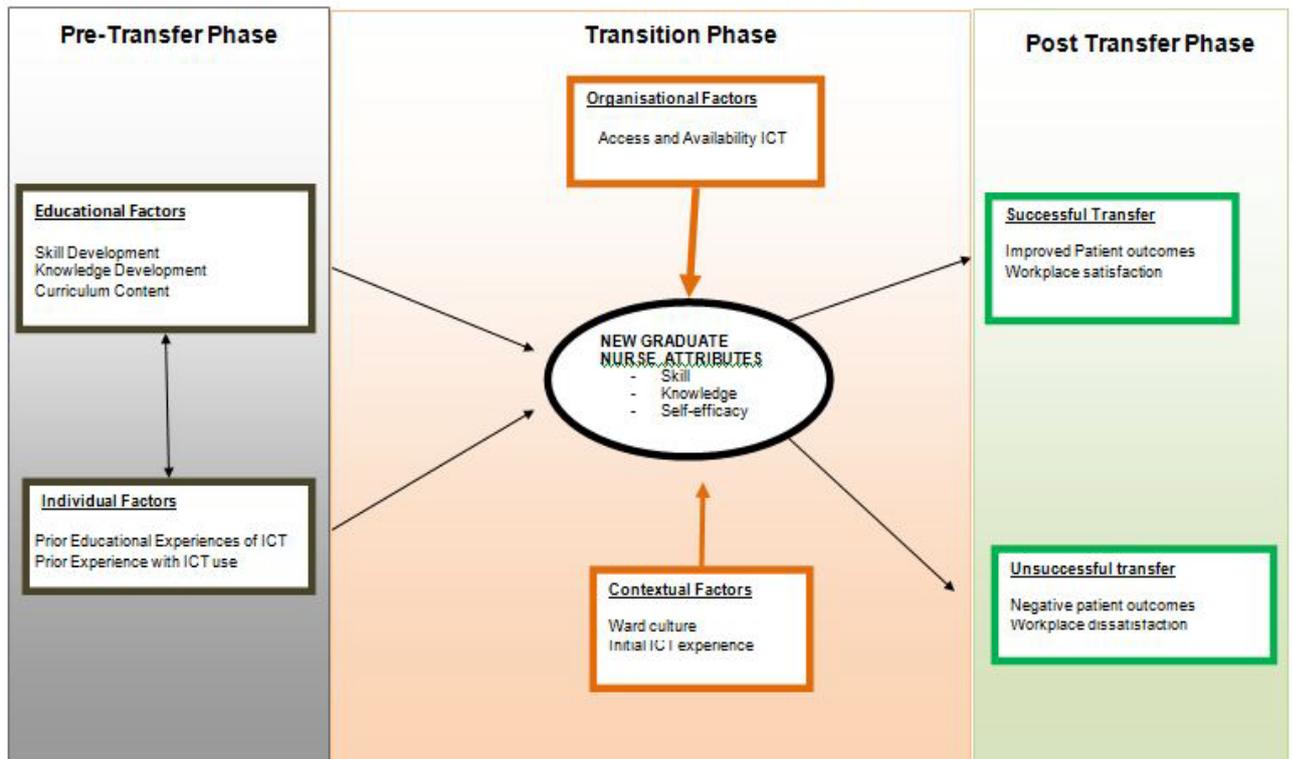
DATA ANALYSIS

The audio taped interviews were transcribed word for word. Thematic analysis was used as it provides a flexible and useful research tool, which can potentially provide a rich and detailed account of data (Aronson, 1994). By reading and re-reading the transcripts while referring to the research questions, phrases, statements or paragraphs of significance to the research questions were colour-coded. These colour-coded sections of the transcripts were grouped by manually cutting and pasting. Numeric codes were retained for future reference. This structure provided the framework within which data interpretation proceeded.

Once the material from the transcripts had been coded, it was possible to start the process of questioning and conversing with it, thereby pursuing particular lines of enquiry and uncovering embedded meanings. This was done by moving from what was already known in a fairly superficial way to a deeper understanding. In order to maintain an audit trail and to document my developing perspectives and reflections, brief notes were made in the final versions of each of the transcripts. These notes prompted the researcher to return to a particular participant's transcript for comparison or clarification, referred the researcher back to the related literature, and at times recorded my concerns and queries. By immersion in the text surrounding the depicted categories, factors and themes, recurring patterns and alternative explanations were uncovered. As the texts were re-read a number of times on the computer screen and in hard copy, new ideas emerged and were integrated into the analysis.

FINDINGS

The conceptual framework was derived from the literature and provides a theoretical basis and a schematic view of the core concepts that emerged from the study; it identifies the factors that influence the transferability of ICT from university to the clinical workplace and the related consequences. The conceptual framework was modified from the work of several authors (Kontoghiorghes, 2002; Lewin, 1997; Vroom, 1959) following the identification of the main themes within the process of transfer of ICT skills. The conceptual framework clarifies the inter-relationship of the themes and is a visual aid that was used to refine the data analysis. The conceptual framework (See Figure 1) consists of the three main phases: pre-transfer, transition, and post-transfer.



In the pre-transfer phase, the factors that enabled the transition of ICT skills from university to the workplace are identified as **educational** and **individual** factors. Through their experiences at university the new graduate nurses developed three key attributes that facilitated the transition phase: **ICT skills, knowledge, and self-efficacy**. In the transition phase, new graduate nurses are influenced by **organisational** and **contextual** factors which impacted on both their feelings of self-efficacy and the transferability of their ICT skills. The results of transferability become evident in the post-transfer phase either with positive or negative personal and professional outcomes. This phase illustrates the consequences of successful or unsuccessful transfer and is identified in this framework in terms of patient outcomes and workplace satisfaction.

PRE-TRANSFER PHASE

Educational Factors

Participants identified the specific ICT skills they felt they had learned through their university education. For most, the skills they gained were not part of a particular course or formally taught, but were embedded within the course content and were required in order to complete the requirements of assignments for a variety of courses. Software skills that participants

identified as having developed were database management, word processing, MS PowerPoint®, the use of various search engines and identification of reliable sources of information.

The participants' stories demonstrated how many of their ICT skills were learned in a self-directed manner. Self-directed learning is a process through which learners: identify and assess their learning needs with or without the assistance of others, set goals and use available resources to achieve their learning outcomes (Knowles, 1975). Evie (pseudonym) provided an example of how she gained ICT-related searching skills through self-directed learning:

We had assignments that you needed to provide journal articles for. We were told to go into the library and do a [data base] search on that subject. They didn't tell you how to go through it. We just had to work it out. Luckily I managed to work it out.

The participants were able to clearly identify skills that they acquired at university and their usefulness within the university context. However they did not always recognise a link between their experiences of using ICT at university and the ability to use ICT once in the workforce. Ava stated:

I didn't actually learn the computer skills from uni, that was just self-directed plodding my way through, but most definitely now if I find a subject that interests me or if I want to find best practice, I can certainly navigate my way to a site that will give me that.

Farley also explained:

Uni forced me to learn all sorts of general computer stuff but they never said you will use this on the wards or this is like the software in a hospital. We should have been shown what we would be using.

The failure to recognise the clinical relevance of the ICT skills that had been acquired at university and their transferability to the workforce was evident throughout the interviews. The lack of recognition of the clinical relevance of ICT skills acquired at university seemed to inhibit participants' perception of the transferability of ICT skills to the workplace. This resulted in some of the participants feeling unprepared to use ICT in the workplace.

Individual Factors

The participants were asked about their prior knowledge and ICT skills. Their responses were varied and ranged from having formal ICT education prior to studying nursing to no experience in using ICT. An example is provided by Gaby, a nursing graduate who had TAFE (Technical and Further Education) level computing and software skills prior to entry to the Bachelor of Nursing. She was adamant at the beginning of the interview that her university education had not had a significant impact on her skills or confidence with ICT. However, she felt this had changed as a consequence of her nursing studies and later in the interview Gaby explained that the library course at university had in fact helped develop her ICT skills:

When we first went to uni we did an hour library course and they showed us how to open up databases. I had never known how to access databases before.

TRANSITION PHASE

Skill, Knowledge and Self-efficacy

Through their experiences at university the new graduate nurses developed three key attributes that facilitated the transition phase: ICT skills, knowledge, and foremost amongst these, self-efficacy. The participants were often unfamiliar with the ICT used in the workplace but because of their self-efficacy many were able to transfer their ICT skills and knowledge to an unfamiliar environment. Farley explained how his self-efficacy had enabled him to circumvent some of the barriers to the use of ICT:

When I first started on this ward I had no idea what Power chart was or even how to get into it. I felt like I was back at uni doing that awful research subject. I had no idea how to use the databases for that subject.

Researcher: So what did you do to learn about Power chart?

Farley: I asked around and someone logged me on and then I just did the same as I did at uni, played with it until I understood it. I figured I learnt what to do with the research stuff so how could this be any harder.

Despite feeling inadequately prepared for the challenges surrounding the use of ICT, the participants described how the self-efficacy they developed during their undergraduate studies was a catalyst for their engagement with ICT in the clinical workplace and provided the confidence they needed to persist in using ICT despite the barriers they encountered.

Organisational Factors – Access to and Availability of ICT

When asked about their current use of ICT in the workplace the participants described how a combination of organisational and contextual factors in the workplace and the lack of educational preparedness contributed to feelings of inadequacy.

Organisational factors included lack of access to ICT software, unavailability of ICT hardware, and delays in repairing faulty equipment. The participants detailed the challenges faced on the wards when computer equipment failed and how the lengthy process of having it repaired or replaced led to a battle between medical staff and nursing staff when trying to use the remaining computers as *often numerous staff were battling* for the use of limited resources. Charlotte described how the lack of hardware and delays in repairing ICT equipment impacted on how she viewed the role of ICT in nursing:

The ward I was in had four computers plus the ward clerk's, so that's five on the ward and at any one time only one or two were working including the clerks. One computer was fixed once in the whole six months I was there. They are not seen as important tools so I don't bother.

Another organisational barrier included the lack of access to clinical ICT applications. The participants identified that, despite filling in and submitting the application forms, their ICT access was often delayed. In some cases they had not received access at all, despite repeated enquiries and attempts to gain access. Some of the participants negotiated ways to work around this barrier. Charlotte describes her difficulty with gaining access to the online pathology software package:

I did have a problem trying to get access. I rang up two or three times, I rang up IT customer service and they would ring back and say 'no it's not done' and in the end I didn't bother getting it. Anytime I needed access I would get someone else to sign me in.

Contextual Factors – Ward Culture and Initial ICT Experiences

The participants' discussion of ward culture highlighted the individual nature of each ward and the impact of each ward on their use of ICT. Participants described how in some wards ICT was seen as a learning tool for staff members. The use of positive reinforcement encouraged participants to share the knowledge and skills that they gained from using ICT with other staff members. Ava identified the encouragement she received by the ward staff to utilise ICT and the educational benefits both she and other staff members received as a result:

As a new grad in my last ward I was encouraged by educators, other RNs and team leaders because they could see exactly what I was doing. I might be looking up something to do with wound management or I might be looking up normal saline versus hypertonic saline or something and more often than not I was looking up something that they didn't know either and it is a way of sharing information around the ward.

The participants who were encouraged to use ICT during their initial workplace experiences explained how they continued to use ICT on a regular basis even when moving to other wards, regardless of the culture of the new ward. These participants displayed a clear understanding of the benefits of ICT to patient outcomes and also the benefits to their continued learning. For example, Kate's first rotation was in a rehabilitation ward where she was encouraged by the staff to use ICT to monitor patients' pathology results, read multi-disciplinary reports online and access educational opportunities. Kate's second rotation was in a surgical ward. Kate identified that this ward culture did not encourage the use of ICT and sitting in front of a computer was seen as not working. Despite this Kate stated:

I look up my patient pathology every shift. Other than the (one) in charge I think I might be the only one who does, but how else do I know what my patient's needs are. Particularly the older patients who might have come in with an acute delirium or even had surgery and I have no idea what their previous cognitive level is. By reading the ACAT [Aged Care Assessment Team] reports online I at least have a basic understanding of where they were at before surgery.

I think it's because it was drilled into to me during my first rotation as a new graduate how important it was to know bloods and pre morbid levels. I am really confident with the pathology and have enrolled and completed some courses through the online education site and that's simply because of the support and education I got from my first rotation.

Other participants described how, in some wards, sitting in front of a computer was not seen as contributing to patient care or ward work. In some instances there was open discouragement of the use of ICT. Charlotte explained how accessing ICT to research an unknown diagnosis was not encouraged on one of the wards that she worked in:

If you have a patient who has got an unusual diagnosis and you don't know anything about it, to sit down in front of a computer and read up about it is no... it is not a thing you should do.

POST-TRANSFER PHASE

Patient Outcomes and Workplace Satisfaction

Participants identified that positive ward culture regarding the use of ICT played an important role in patient outcomes. They suggested that awareness of patient pathology results impacted on *treatment and the patients length of stay*; that access to medication information online allowed for *identification of contraindications that might otherwise be missed*; and that access to online multidisciplinary reports *gives you reliable data that are often missed or not given correctly at handover or when a patient is moved from one ward to another*. What was also apparent from the interviews was that through access to ICT participants were able to piece together their clinical knowledge and often *foresee what the doctor would be thinking*. This validated and increased their confidence in clinical knowledge. The positive impact that ICT had on patient outcomes reinforced the participants' sense of satisfaction in the workplace. Farley summarised this by saying:

I had a patient and I did not know anything about his illness. I did some internet searching and read up on his medications and the diagnosis and I was able to figure out how the doctors would treat him. It really made me feel good that I was right and now I know that if someone else comes in with the same thing I will be confident with caring for them.

Facilitator: How did your internet research help the patient?

Farley: I talked to the (one) in charge about using a sub cut set as the disease made it difficult for the patient to swallow and I was able to explain my rationale. I put the sub cut set in and this saved the patient discomfort from trying to swallow pain relief medication or having multiple injections. Although the patient's diagnosis was poor I was still able to provide some relief from symptoms with minimal pain for the patient. I know that I provided the best care I could.

Gaby also described how she used her skills in the workplace to support patient care:

On this ward you will get a row of different types of disease processes that patients present with. If I am not sure of the disease process I will go research it using a database search to find info and then I will go back pass it on to that patient or that information improves my practice with the patient.

In contrast, some participants reported that the use of ICT in some ward environments was seen as the role of senior nursing staff or in-charge nurses exclusively. In addition, senior nursing staff were sometimes viewed as gatekeepers to ICT skill development opportunities that would enhance graduates' nursing practice and help them fulfil future roles:

I never filled out an IIMS [Incident Information Management System]. Every time one had to be filled out the in-charge would do it. I really wanted to do one myself so I knew what to do. I often think, how will I ever be able to be in charge if I can't even do the basics like an IIMS?

DISCUSSION

Transferable ICT Education Requires a Structure and Defined Competency Standards.

In order to assess whether the participants' ICT skills were transferable to the workplace it was necessary to first identify the ICT skills they acquired while studying at university. The participants identified database management, word processing, MS PowerPoint®, the use of various search engines and identification of reliable sources of information as skills that they acquired from their university education. However, it was noted that ICT skills were not formally taught as a component of a particular course but were usually acquired as a consequence of completing assignments for particular courses. This rather serendipitous acquisition of ICT skills may have contributed to the participants' feelings of being unprepared for the clinical ICT requirements of their transitional year.

The second step in determining the transferability of ICT skills to the workplace was to identify the actual ICT skills required by the new graduate nurses in clinical settings. The participants identified pathology software and database skills as essential ICT skills for their first year of practice. This finding is of interest as there is a limited number of studies specifically related to graduates' use of ICT in practice (Lee, Chen, & Wang, 2002; McCannon & O'Neal, 2003). In a study by Eley et al. (2008) the ICT skills identified as clinically relevant by both experienced nurses in the study and new graduates were databases and patient management systems. For new graduate nurses in the current study, being able to search for reliable sources of

information, a skill they learned in research courses at university, was particularly relevant to clinical practice. This is not surprising given the amount of information available online. This finding not only adds to the current body of knowledge available on the types of ICT skills that are essential for nurses in their first year of practice, but it also identifies the ICT skills that should be taught in pre-registration programs.

Despite studies claiming that it is essential for graduates to have a requisite level of ICT competence, currently there are no clear guidelines in Australia that specify what these competencies should be. It is therefore timely that a draft set of ICT competencies for registered nurses is currently being developed by Queensland University of Technology as part of a Delphi study (Foley, personal communication, 2010). National ICT competency standards should provide a uniform platform for educators and employers regarding the ICT competence levels expected of new graduates; and to enable opportunities for discussions about the most appropriate means to ensure competency attainment.

The findings from this study indicated that the participants' university experiences helped them to develop a level of self-efficacy that was facilitative of the transfer of their ICT skills to the workplace and this assisted them in managing ICT requirements with which they were unfamiliar. Their self-efficacy also helped them overcome the barriers to ICT use they experienced in the workplace. Landy and Conte (2007, p. 384) define self-efficacy as the confidence in one's ability to successfully complete a task. There is a direct relationship between self-efficacy beliefs and task performance. Individuals with higher levels of self-efficacy outperform those with lower levels (Barling & Beattie, 1983; Wood & Locke, 1987). Self-efficacy beliefs have been shown to impact the decision to engage in various behaviors such as learning to use computers (Hill, Smith, & Mann, 1987). This study has identified self-efficacy as a factor that facilitated the transfer of ICT skills to the workplace. However, transfer did not occur in all instances. Self-efficacy and transfer of ICT skills were affected by both organisational and contextual factors.

A Change of Culture Related to the Use of ICT

Lack of access to ICT in the workplace has been suggested by many authors as a factor that impedes skill transfer (Cullen, 2001; Hannah, Guillemin, & Conklin, 1985; Hegney et al., 2006). This is consistent with the current study as a number of participants experienced difficulty obtaining passwords and login information. This finding is of note as it relates not only to ICT access, but to the value that the organisation places on the role of ICT in nursing practice.

It is also important to note the difference in the use of ICT depending on ward cultures. In some wards sitting in front of a computer was not seen as a constructive use of time. In these wards there was a perception that ICT was not necessary to patient care. This aligns with the literature that describes the use of ICT being viewed as the antithesis of therapeutic practice (Bernardo, 1998; Mackey, 1995); and in opposition to caring (Cooper, 1994; Ray, 1987).

The culture of senior nursing staff acting as gatekeepers to ICT use and skill development opportunities requires attention. Manias and Street (2009) also identified how nurses engaged in gate keeping practices to help them remain in control. However, ward cultures were inconsistent across the area health service in which the study was located and in some instances the ward culture actually facilitated ICT skill transfer. The results of this study suggest that routine use of ICT has a positive impact on patient outcomes and new graduate workplace satisfaction. The routine use of and opportunities to practise with ICT impacted positively on the transferability of ICT skills from university to the workplace. Pearcey and Elliot (2004) suggest that the impact of a good ward culture cannot be overstated (p. 384).

Participants who experienced a positive ward culture and who were encouraged to use ICT almost invariably identified a relationship between ICT use and patient outcomes. They also described increased workplace satisfaction and a commitment to use ICT in their future clinical experiences, even in those wards with a negative culture of ICT use. There is a body of literature that supports this finding with several studies suggesting that knowledge and skill in ICT offers nurses an opportunity to manage information more efficiently (Wallace, Shorten, Crookes, McGurk, & Brewer, 1999); it improves efficiency in research and best practice (Jacobs, Rosenfeld, & Haber, 2003); and has a positive impact on patient outcomes (Travis, Youngblut, & Brennan, 1994). The positive impact of ICT use on patient outcomes also reinforced the participants' sense of satisfaction in the workplace.

CONCLUSION

The findings from this study identified that the transferability of ICT skills from university to the workplace is impacted by educational, individual, organisational and contextual factors. Further, the themes that emerged from the study and that were presented in accordance with the conceptual framework can be structured under the headings of pre-transfer, transition and post-transfer. For many new graduate nurses ICT is considered to be a 'tool of trade'. Access to adequate ICT and the necessary training opportunities influences a new graduate's work satisfaction and their future employment decisions. Perhaps most importantly, the ability to use ICT was considered essential for working in contemporary healthcare settings and for the provision of quality patient care. These issues are worthy of further consideration and ongoing research.

The authors conclude with the following recommendations:

1. Recommendations for nursing education

- Undergraduate curricula should provide opportunities for the progressive development of ICT competence, including a range of clinical ICT applications;
- Undergraduate programs should incorporate ICT competencies essential for practice;
- At an early stage of the degree nursing programs should make explicit the link between ICT competence and improved patient outcomes.

2. Recommendations for nursing practice

- Orientation programs should include an introduction to and training in the ICT applications that graduates will encounter in their practice;
- The provision of passwords and user ID for ICT access should be organised on employment and become an organisational priority;
- Opportunities for new graduates to access and use ICT should be encouraged and supported by clinical, educational and managerial staff.

3. Recommendations for further research

- Longitudinal studies are recommended to identify whether the effects of positive ward culture on ICT use extends beyond the transitional year;
- An in-depth study of the impact of un/successful ICT skills transfer on patient outcomes and workplace satisfaction is required with a larger sample across various clinical settings.

LIMITATIONS OF THE STUDY

To keep the findings from this study in perspective, it is important to note that the sample was small, with only eight participants. The study was conducted in one area health service and for this reason the findings may not necessarily be transferable to different contexts. Furthermore, the interviews elicited the participants' personal perceptions on the issue of ICT transferability and as such may not always be a complete reflection of the situations described. However, this is in keeping with qualitative methods where the purpose is both to add new insights that stimulate debate and discussion around the issues and to enhance transferability by providing faithful and detailed descriptions of the phenomenon.

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