



Review

E-learning & information communication technology (ICT) in nursing education: A review of the literature

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SUMMARY

Objectives: To examine primary research articles published between January 2001 and December 2012 that focused on the issues for students and educators involved with E-learning in preregistration nursing programs. The literature was systematically reviewed, critically appraised and thematically analyzed.

Background: E-learning is arguably the most significant change to occur in nursing education since the move from hospital training to the tertiary sector. Differences in computer and information literacy for both students and educators influence the success of implementation of E-learning into current curricula.

Data Sources: Online databases including CINAHL, MEDLINE, OVID, the ProQuest Central, PubMed, ERIC and Science Direct were used.

Methods: The criteria used for selecting studies reviewed were: primary focus on electronic learning and issues faced by nursing students and/or nurse educators from undergraduate preregistration nursing programs; all articles had to be primary research studies, published in English in peer reviewed journals between January 2001 and December 2012.

Results: Analysis of the 28 reviewed studies revealed the following three themes: issues relating to E-learning for students; use of information technologies; educator (faculty) issues involving pedagogy, workload and staff development in E-learning and associated technology.

Conclusion: The review highlighted that commencing preregistration nursing students required ongoing education and support surrounding nursing informatics. This support would enable students to progress and be equipped with the life-long learning skills required to provide safe evidence based care. The review also identified the increased time and skill demands placed on nurse educators to adapt their current education methodologies and teaching strategies to incorporate E-learning.

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Introduction

The use of digital technologies and social networking has grown rapidly over the last decades, and these technologies are increasingly being incorporated into the teaching of higher education (Garrison, 2011; Garrison and Anderson, 2003; Laurillard, 2005). As a result, both nurse educators (Bristol, 2005; Mancuso, 2009; Nguyen et al., 2011) and preregistration nursing students (Elder and Koehn, 2009; Jetté et al., 2010; Timmins and Dunne, 2009) are being expected to incorporate and use digital technologies to facilitate learning in

undergraduate nursing curricula. The use of such technologies in education is known as E-learning (Ecampus, 2011; Garrison, 2011; Goodfellow and Lea, 2007; Muirhead, 2007; Skelton, 2007; Laurillard, 2005).

In order to discuss E-learning, it is important to understand the terminology used. These terms include:

- Computer literacy – an understanding of the concepts, terminology and operations that relate to general computer use (Computer Literacy USA, 2012).
- Information literacy – where a person is able to recognize the need for information, determine the extent of information needed, access information efficiently, critically evaluate information and its sources, classify, store, manipulate and redraft information collected or generated and incorporate selected information into their knowledge base (Bundy, 2004).
- Nurse informatics (NI) – the skills required by the registered nurse to integrate nursing science, computer science and information science to manage and communicate data, information and knowledge in nursing practice (Conrick et al., 2004).

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Background

Globally, E-learning has been introduced to nursing curricula in a number of Western countries including Australia, Canada, Greece, Ireland, New Zealand, UK and USA. The move to E-learning is closely linked to the adoption of electronic patient records. Currently, the complex issues surrounding computer literacy and information literacy are hindering the advancement of both nursing students and nurses working with electronic health records. The findings of recent studies (Barnard et al., 2005; Childs et al., 2005; McPherson and Nunes, 2008) revealed that staffing issues, pedagogically sound delivery models and training of both educators and students could not be treated as trivial issues as they are critical to the success of E-learning. The findings also suggested that in order to assure the success of E-learning, the presence of institutional enablers is essential. The Initiative Technology Informatics Guiding Education Reform (TIGER) in North America was developed to meet the goal of providing electronic health records for all citizens. Hebda and Calderone (2010) stress that to meet this goal, nursing education leaders need to provide access to technology and adequate computer resourcing, and to challenge faculty to integrate nursing informatics into their professional activities.

In the United Kingdom, Bond and Procter (2009) pointed out that criteria to evaluate nursing informatics are missing from National Health Service (NHS) documents (Bond and Procter, 2009). In the late 1990s, the inclusion of nursing informatics into preregistration curriculum was thought by the NHS Executive to be opportunistic and dependent on where clinical experience was undertaken (NHS Executive, 1999). In the UK, Bond and Procter (2009) express the urgent need for the development and implementation of a national curriculum for health informatics into preregistration curricula.

Aims

The aims of this literature review were to identify research related to E-learning and associated technologies in preregistration nursing programs and to identify issues for both students and educators who are using E-learning.

Methods

A systematic search of primary research literature was performed using a selection of electronic search tools over three broad categories: preregistration nursing education, preregistration midwifery education and computer education technology. Online databases including CINAHL, MEDLINE, OVID, the ProQuest Central, PubMed, ERIC and Science Direct were searched. Manual searches based on the reference lists and bibliographies of articles, reports and books considered relevant to this study were also performed (Tables 3–6).

The following keywords incorporating 'learning' as part of the search were used; *electronic (E), blended, distance, computer assisted, computer based, digital, electronic, mobile, online computing literacy, Internet, World Wide Web, intranet, Information literacy, computer literacy, information communication technology (ICT), Information technology (IT), nursing, midwifery, student, academic, educator, faculty, teacher, nurse academic, nurse educator, nurse teacher, higher education, tertiary education, undergraduate, preregistration*. The searches were then repeated adding the following key words: *issues, barriers, perceptions, attitudes, readiness, and concerns*.

Inclusion and Exclusion Criteria

Peer-reviewed papers were included where the focus of the study was:

- preregistration nursing students' and or nurse educators' issues and perceptions;

- part of students' course of studies or educators' everyday activities including teaching, research and administrative requirements;
- nurse educators' issues as part of their work and perceptions;
- published between January 2001 and December 2012.

While the search was extensive it was not exhaustive. Studies in languages other than English were not included in this review.

Studies meeting the above criteria were appraised using tools of the Critical Appraisal Skills Programme (CASP) (Oxford University, 2006). Included articles were then thematically analyzed following the process outlined by Braun and Clarke (2006).

Results

Initial searches identified 346 studies for possible review. The title and abstract then were read to determine relevance; 262 studies were discarded as not being directly relevant to the review, leaving 84 for more detailed examination. These studies were then examined against the inclusion criteria. A further 42 were judged as not meeting the selection criteria, leaving 42 articles. Another 14 studies were discarded as not meeting the appraisal criteria leaving 28 studies to be included in the review (see Fig. 1). A thematic appraisal was then undertaken and specific themes were identified using a six step process suggested by Braun and Clarke (2006)(Table 1).

Study Locations

The studies produced were located across eight countries including USA (n = 11 including one combined with Canada), Australia (n = 9), UK (n = 5), and Greece, Ireland and New Zealand each having one study. No recent papers published in English meeting the inclusion criteria were found in Latin American countries or Asia.

Study Design

The 28 selected studies were divided into three groups: qualitative, quantitative and mixed methods. Of the included studies the most frequent research method was quantitative with 16 studies, mixed methods with nine and three qualitative studies.

Theme Identification

Three themes were identified, no single theme was found across all articles. The themes and their sources are detailed at the end of the paper in Tables 2a, 2b, 2c. The three themes were: 1) issues relating to E-learning for students; 2) using information communication technology (ICT) and 3) staff development relating to E-learning for educators. Each of the reviewed studies showed a mix of issues that supported and detracted from E-learning in preregistration nursing programs.

Theme 1: Issues Relating to E-Learning for Students

The theme was found in 71% (n = 20) of the reviewed articles (Bembridge et al., 2011; Billings et al., 2001; Blake, 2009; Bond, 2009; Christianson et al., 2002; Creedy et al., 2007; Deltsidou et al., 2010; Elder and Koehn, 2009; Farrell et al., 2007; Glaister, 2007; Kelly et al., 2009; Kenny, 2002; Levett-Jones et al., 2009; Maag, 2006; McNeil

Table 1
Keyword search.

Academic blended, computer assisted, computer based, computing literacy, computer literacy, digital, distance, educator, electronic (E), faculty, higher education, information communication technology (ICT), information technology (IT), information literacy (IL), internet, intranet, mobile, midwifery, nursing, online, student, nurse academic, nurse educator, nurse teacher, preregistration, teacher, tertiary education, undergraduate, World Wide Web

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