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Using reusable learning objects (rlos) in injection skills teaching: Evaluations from multiple user types

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SUMMARY

Background: Clinical skills are a critical component of pre-registration nurse education in the United Kingdom, yet there is widespread concern about the clinical skills displayed by newly-qualified nurses. Novel means of supporting clinical skills education are required to address this.
Methods: A package of Reusable Learning Objects (RLOs) was developed to supplement pre-registration teaching on the clinical skill of administering injection medication. RLOs are electronic resources addressing a single learning objective whose interactivity facilitates learning. This article evaluates a package of five injection RLOs across three studies: (1) questionnaires administered to pre-registration nursing students at University of Nottingham (UoN) (n = 46) evaluating the RLO package as a whole; (2) individual RLOs evaluated in online questionnaires by educators and students from UoN; from other national and international institutions; and healthcare professionals (n = 265); (3) qualitative evaluation of the RLO package by UoN injection skills tutors (n = 6).
Results: Data from all studies were assessed for (1) access to, (2) usefulness, (3) impact and (4) integration of the RLOs. Study one found that pre-registration nursing students rate the RLO package highly across all categories, particularly underscoring the value of their self-test elements. Study two found high ratings in online assessments of individual RLOs by multiple users. The global reach is particularly encouraging here. Tutors reported insufficient levels of student-RLO access, which might be explained by the timing of their student exposure. Tutors integrate RLOs into teaching and agree on their use as teaching supplements, not substitutes for face-to-face education.
Conclusion: This evaluation encompasses the first years postpackage release. Encouraging data on evaluative categories in this early review suggest that future evaluations are warranted to track progress as the package is adopted and evaluated more widely.

Introduction

Despite significant changes in pre-registration nursing education in the United Kingdom, concern still surrounds the effectiveness of nursing curricula in successfully delivering clinical skills education. Many innovative approaches have aimed to augment skills acquisition among pre-registration nursing students.

This article presents one such innovation: a package of five interactive reusable learning objects (RLOs) detailing the practice of delivering medication via injection. This paper presents evaluations of this RLO package from the perspective of students, staff and health care professionals from a range of UK-based and international institutions.

Background

In the UK, the last two decades have seen the traditional apprenticeship model of nurse training undergo radical reform. A 1999 Department of Health report found that "students completing training have not been equipped at the point of qualification with the full range of clinical skills they need…a stronger practical orientation to pre-registration education and training is needed" (Department of Health, 1999, p. 14). The United Kingdom Central Council for Nursing and Midwifery Education considered these findings in the compilation of the Fitness for Practice report (United Kingdom Central Council for Nursing Midwifery and Health Visiting, 1999), leading to major curricular changes in nurse education in the UK. This overhaul aimed to address, among other issues, the perceived paucity of clinical skills competence in newly-qualified nurses (Carr, 2008).

However, despite curricular reform aimed at ameliorating skills acquisition, widespread concern persists regarding the clinical skills competence exhibited by newly-qualified nurses, both nationally and internationally (Bloomfield et al., 2013; Borneuf and Haigh, 2010). Scholarship in the area largely agrees that this is a global issue, requiring

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alternative, innovative strategies in order to address the shortcomings in clinical skills education (Barratt, 2010; Nickless, 2011).

A variety of such innovations have aimed to address these deficits. Clinical Skills Laboratories (Hilton, 1996); Clinical Demonstrators (Hilton and Pollard, 2005), Clinical Education Facilitators (Lambert and Glacken, 2005) and Lecturer Practitioners (Fairbrother and Ford, 1998) are among the efforts to supplement clinical skills education. However, these approaches do not escape the educational barriers that undermine skills acquisition in nurse training generally, requiring the provision of dedicated staff, mentors, resources and time that are in short supply in UK healthcare education (Hilton and Pollard, 2005; Borneuf and Haigh, 2010).

CAL in Health Education

As an alternative, computer-assisted learning (CAL) provides a solution that escapes these barriers (Berke and Wiseman, 2004). Though expensive and labour intensive upon creation, CAL products—when standardised and reused over time, across institutions and stakeholders—can offer long-term value that offsets initial cost (Ruiz et al., 2006; Windle and Wharrad, 2010). Providing flexible, asynchronous teaching—learning (Blake, 2010); encouraging independent learning (Thiele, 2003); and promoting critical and reflective thinking (Ali et al., 2004), CAL is now a major player in health education (Keating, 2011).

Reusable learning objects (RLOs) are one such CAL application. RLOs are interactive, multimedia learning tools, focussed on a single learning objective. They provide bite-sized chunks of learning involving self-test elements; are accessible anytime, anywhere; and facilitate autonomous learning (Windle and Wharrad, 2010). In health education, RLOs are gaining momentum as teaching and learning supplements (Windle and Wharrad, 2010), being utilised in a variety of health education contexts: in statistical-methods training (Bath-Hextall et al., 2011), in pharmacology (Lymn et al., 2008) and in biological sciences (Wharrad et al., 2001). A variety of studies suggest that RLOs provide effective complements to teaching, contributing to improved assessment attainment and promoting autonomous learning (Lymn et al., 2008; Blake, 2010; Bath-Hextall et al., 2011).

CAL for Clinical Skills Education in Nursing

Previous CAL approaches to clinical skills acquisition in nursing education vary in terms of approach and effectiveness (examples include Nickless, 2011; Kelly et al., 2009; Barratt, 2010), with one integrative review concluding that further research into CAL as an aid to nursing skills education is merited (Bloomfield et al., 2008). Specific uses of CAL in injection skills teaching reported in international research include a web-based injections course (Lu et al., 2009); a multi-media training course (Tsai et al., 2004); and a virtual reality simulation (Tsai et al., 2008). However, the step-by-step procedure of injection delivery has not been the focus of an interactive resource such as the RLO package presented here.

Context and Rationale

This RLO injection series evolved following concerns raised by teaching staff at UoN regarding injections practice sessions at UoN. Staff felt that issues around health and safety, skin preparation and equipment selection were underrepresented in skills sessions and could not be covered at a pace suitable to all students.

The Health E-Learning and Media team (HELM[1]), School of Health Sciences, Nottingham, is partner to the Centre for Excellence in Teaching and Learning in Reusable Learning Objects (RLO-CETL[2]). HELM has developed a significant online RLO repository aimed at enhancing health education. Therefore, RLOs are a well-established curricular element in the School with which nursing students are familiar. This in-house expertise and students' familiarity with RLOs made the development of an RLO package a natural response to concerns. RLOs presented a platform in which concerns could be addressed via a medium that offers repeated, anytime access at all learning paces. Between 2009 and 2011, a package of five RLOs was developed using a validated RLO-development methodology (Windle and Wharrad, 2010), with the resources being peer-reviewed by their intended end users at two points during their development to ensure their quality and relevance. Each RLO addresses an aspect of injection technique, has a specific learning outcome, involves interactive assessments, and takes 4 min on average to complete. These RLOs are openly available online under the Creative Commons 2.0 licence,[3] accessible at the addresses in Table 1.

Given that the RLOs evolved as a response to need, our aim was to explore if and how this need has been addressed. We do this by evaluating the RLOs in four categories: access, usefulness, impact and integration, spanning three studies, assessing the RLOs from multiple user perspectives.

Methods

Materials

- The first questionnaire used was a measure developed by RLO-CETL, used to assess the access to, usefulness, impact and integration of the RLOs, with a mix of Likert and open-ended items. The questionnaire was administered via pen and paper in study one, and a shortened ten-item measure was used in study two via an optional link when users completed the relevant RLO.
- The second questionnaire was a four-item, open-ended questionnaire, used in study three to evaluate the tutor perspective on the access to, usefulness, impact and integration of the RLOs. Questionnaire items were developed to reflect these study interests.

These were three measures of nine that comprise a validated toolkit for the evaluation of RLOs (Wharrad et al, 2008).

Method and Participants

1. The first study used the first questionnaire to assess the RLO package as a whole in terms of the assessment criteria. Participants were pre-registration students at UoN ($n = 46$), with pen-and-paper questionnaires administered following completion of a clinical skills module and collected anonymously.
2. The second study used the online questionnaire to evaluate each RLO individually. Each RLO was evaluated in terms of access, usefulness, impact and integration from multiple stakeholder perspectives ($n = 265$), including UoN students and staff ($n = 84$); staff and students from other national and international educational institutions ($n = 156$); and health care professionals based nationally and internationally (HCPs) ($n = 25$). Upon completing individual RLOs online, these participants followed a link to this questionnaire.
3. The third study employed the second questionnaire to evaluate the RLOs from the perspective of UoN injection skills tutors ($n = 6$), comprised open-ended questions on the RLO package as a whole. These questionnaires were emailed to all clinical skills teaching staff at UoN and returned via email.

[1] http://www.nottingham.ac.uk/helm/home.aspx.
[2] http://www.rlo-cetl.ac.uk/.
[3] http://creativecommons.org/licenses/by-nc/2.0/uk/.