



Can skeletal image reporting be taught online: Perspectives of experienced reporting radiographers?

Lesley Leishman*

School of Health Sciences, Faculty of Health & Social Care, Robert Gordon University, Aberdeen, AB10 7QG, UK

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ABSTRACT

Background: Image interpretation relies upon expert clinical skill and comprehensive knowledge and understanding of the theories and concepts that underpin clinical practices. Traditionally, radiographer reporting education has been delivered using a blend of classroom based learning combined with workplace clinical practice. The direct and indirect costs of staff development and maintenance of the service has seen the incorporation of e-learning into courses in other health professions. Yet, despite its proven success, in the UK radiography has been resistant to progression into e-learning for reporting. This study aims to explore the perceptions of reporting radiographers to interactive online delivery of skeletal image reporting education.

Method: Invitations to participate in the study were sent to 80 radiology departments in the UK. Reporting radiographers were asked to complete an online questionnaire to detail their reporting education experiences and to consider whether online delivery was a viable option.

Results: A total of 86 radiographers participated in the study. They could see potential benefits of online delivery but agreed it would only be suitable for delivery of theoretical subjects, and that development of practical/clinical skills required interaction with experts in the field to enhance learning.

Conclusion: Image reporting education is not suitable for entirely online delivery, and a blended learning solution, where online classroom based learning is combined with work based learning is more appropriate as it allows for interaction with experts in the field of reporting to facilitate the development of reporting skills enhance the overall learning experience.

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Introduction

The analysis, interpretation and diagnostic reporting of skeletal radiographic images is a complex, multifactorial process that relies upon both expert clinical skill and comprehensive knowledge and understanding of the theories and concepts that underpin clinical practices. Traditionally, interpretation and reporting has been taught using a blend of classroom based learning combined with workplace clinical practice. The direct and indirect costs of staff development are widely reported,¹ with implications for service sustainability a particular feature of geographically distant locations.² A nationally recognised shortage of radiologists³ to supervise workplace experience and support classroom based academic learning has challenged health professionals to investigate alternative mechanisms to deliver image reporting programmes.⁴

In response, in 2005 a joint venture by the Department of Health and the Royal College of Radiologists introduced the e-Learning for

Health: Radiology – Integrated Training Initiative (R-ITI), a blended learning solution, combining traditional teaching models with e-learning techniques, which delivers the entire radiology core curriculum through an interactive electronic learning platform.⁵ According to its curriculum guide, the purpose of the R-ITI is to supplement the learning of ST1–3 specialist registrars on the 5-year radiology training scheme and increase training capacity without putting any additional strain on current resources.

A critical review of literature showed that distance and e-learning formats are also being used more widely in other healthcare professions, both at undergraduate and postgraduate level, including nursing^{6–8} and dentistry.^{9,10} Whilst the literature did highlight the issues of lack of interactivity with tutors and peers to enhance the learning experience^{6,8,9} and the difficulties faced in teaching clinical/practical skills,⁷ the literature also highlighted the many potential benefits, namely the flexibility for the students to fit study around personal and professional commitments^{1,2,6,8,9} and the potential for the Higher Education Institutions (HEI) to attract larger student numbers from a wider geographical area.^{6,11} The authors also discussed possible solutions to the negative issues by embracing

* Tel.: +44 (0) 1224 263262; fax: +044 (0)1224 263290.

E-mail address: l.leishman@rgu.ac.uk.

new technologies such as discussion forums^{6,8} to promote inter-activity, and the use of simulation software^{9,10} for the development of practical skills.

In the radiography profession, the value of blended learning, incorporating e-learning techniques, has been studied^{12,13} and, despite highlighting the same potential drawbacks as the other healthcare professions previously discussed,^{6–10} it has been shown to be beneficial. Yet, despite this proven success and a growing demand for online and distance learning provision, in the United Kingdom (UK) radiography has been resistant to progression into e-learning for diagnostic reporting. Radiographer reporting continues to be necessary for the provision of timely reports and effective patient care,¹⁴ and easier access to flexible training which would minimise the effects on personal and professional commitments would be beneficial to the radiographers, their employers and ultimately the service users. Analysis of all radiographic reporting programmes across the UK in 2009¹¹ failed to identify any that delivered in an interactive electronic format. Similar to the R-ITI electronic learning platform for radiology, e-Learning for Healthcare (e-LFH): Image Interpretation is a joint venture by the Department of Health and the College of Radiographers, an interactive e-learning resource supporting the development of image interpretation skills. Launched in 2010, its focus is on enabling development of basic image interpretation skills required across the range of National Health Service (NHS) healthcare professions who perform image interpretation as part of their clinical role, including radiographers. The level of image interpretation skills to be gained from participation will enable individuals to give an informed opinion on images, but it does not extend to those of the interpretation and diagnostic reporting processes undertaken by skilled reporting radiographers, nor is the resource available to HEIs.

Given the progress reported by the R-ITI¹⁵ and the slow pace of change for radiographic image reporting courses, this study aims to explore the perceptions of experienced reporting radiographers of interactive online delivery of skeletal image reporting education.

Method

Whilst the study was designed to obtain predominantly qualitative data, some investigation of the demographics of the participants and frequency of the responses was considered beneficial, given that much of the previous literature had highlighted similar potential benefits/drawbacks of online course delivery, and it would be interesting to establish if the participants of this study had similar opinions.

A combination of question types was incorporated into the questionnaire; closed-response questions¹⁶ were devised from the issues that had arisen in the review of previous literature. Some did however allow the participant to add their own comments to the list of answers offered; this was felt to be more appropriate as closed-response questions have the potential to introduce bias¹⁶ and the purpose of the research was to elicit the personal opinions of the radiographers taking part. Open-ended questions were also incorporated to allow more detailed responses to be given. Given the high costs and poor response rate of postal questionnaires¹⁷ an online format was adopted.

The whole of the UK was targeted to ensure a sizeable sample of participants. It was also felt that the issue of geographical location would always be raised by reporting radiographers in Scotland, and targeting the whole of the UK would enrich the data gathered.

There is currently no national database of reporting radiographers. Previous research requiring similar participants identified them by targeting hospitals throughout the UK that had both an Accident and Emergency (A&E) department onsite and a radiography service.¹⁸ Some sites (Trusts) had more than one hospital fitting the inclusion criteria, although it was impossible to establish from these

sources how many, if any, reporting radiographers were employed at each. The decision was made to work on the assumption that there would be one reporting radiographer at each of the hospitals, although the researcher was aware that some would have more than one and some would have none at all, giving a potential recruitment figure of 240 participants. There is no agreed standard for the acceptable minimum response rate, but it seems to be generally agreed that below 60% ($n = 144$) is sub-optimal.¹⁹

Approval to carry out the study was granted by the School of Health Sciences Research Review Group (SRRG) at the Robert Gordon University. An application was subsequently made for approval of the project proposal by the NHS Research Ethical Committee (REC) and the NHS Research and Development (R&D) offices. Approval was granted for Scotland but correspondence received from the National Institute for Health Research Coordinated System for gaining NHS Permission (NIHR CSP) Unit in England stated that the study was not eligible for inclusion in the NIHR Clinical Research Network (NIHR CRN) Portfolio, because it was a student project with no external funding. The letter did state, however, that this decision did not mean that the researcher was prevented from gaining NHS permission outside the CSP. Communication with the local NHS Research Scotland Coordinating Centre (NRSCC) confirmed that this refusal would mean the researcher contacting the REC of each individual site (Trust) where permission to carry out the research was being sought. Further information on the process was sought from the NHS R&D Forum Website (<http://www.rdforum.nhs.uk/001.asp>) and this provided the researcher with contact information for the individual R&D offices throughout the United Kingdom. Four months later a cut-off date was set for receiving approvals and letters and participation packs were sent to the sites who had by then approved the project ($n = 80$).

Initial contact was made with the radiology managers, asking them to act as gatekeepers for the project, only passing on participation information to the relevant staff member(s) if they felt it appropriate. Informed consent was gained from participants through a check box at the start of the online questionnaire. The time frame set for data collection was 4 weeks.

Where previous studies have sought to explore participants' perceptions by questionnaire, where open questions are incorporated to elicit unique individual responses, data analysis has been in the form of coding/categorisation of responses and identification of themes.^{13,20} Given the purpose of the research, this was felt the most appropriate method for this study. Frequency of responses to the questions was analysed using the Statistical Package for Social Sciences (SPSS v.19.0) statistical package.

Results

By the end of the specified data collection period, 86 participants had completed the online questionnaire. As this was above the set minimum 60% response rate, the data collection period was terminated. Of the 86 participants who completed the online questionnaire, 72.1% ($n = 62$) were female, which was to be expected in a female dominated profession; 81.3% of all qualified diagnostic radiography staff in the UK in 2007 were female.²¹ The majority of participants were either in the 36–45 years age range (34.9%; $n = 30$) or the 46–55 years age range (37.2%; $n = 32$). The results of this question were as expected and, given that radiographer reporting is an advanced skill practiced by experienced clinicians, it was not surprising to see only 2.3% of participants ($n = 2$) in the 20–25 years age group (Fig. 1).

Geographical location of current place of employment

Participants were asked for the geographical location of their current place of employment to establish whether or not the

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