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Towards a research informed teaching experience within a diagnostic radiography curriculum: The level 4 (year 1) student holistic experience

Robert Higgins [a,b,*], Peter Hogg [a], Leslie Robinson [a]

[a] School of Health Sciences, University of Salford, Salford, United Kingdom
[b] The Clatterbridge Cancer Centre NHS Foundation Trust, Wirral, United Kingdom

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ABSTRACT

Aim: This article discusses the level 4 (year 1) diagnostic radiography student holistic experience of the Research-informed Teaching experience (RiTe) at the University of Salford, UK. The purpose of RiTe is to expose undergraduate radiography students to more formal research, as part of their normal teaching and learning experience.
Method: A grounded theory approach was adopted and a focus group with eight level 4 students was used to explore and evaluate the student experience and perception of RiTe.
Results: Open coding defined categories and sub-categories, with axial and selective coding used to interrogate and explore the relationships between the focus group data. A number of insights were gained into the student holistic experience of RiTe. The issue of leadership for level 4 students was also identified.
Discussion: The focus group participants found RiTe to be an extremely positive learning experience. RiTe also facilitated their translation of learnt theory into clinical skills knowledge alongside their understanding of and desire to participate in more research as undergraduates. The article also highlights areas for future research.

Introduction and background

Access to a specialised knowledge base is one of the key-defining features of developing professional practice. Higher education has traditionally influenced the advancement of both theoretical and applied knowledge of professional practice by providing a common setting for both research or *knowledge advancement* and teaching or *education of practitioners*.[1] However, there is a growing demand to combine these traditionally separate activities together to develop a 'research- teaching nexus'; the aim being the improved development of undergraduate professional practice and life-long learning. Research-informed Teaching (RiT) is one such approach whereby students learn via systematic inquiry and develop an appreciation of research within their own discipline.[2,3]

In 2009, the BSc (Hons) diagnostic radiography programme team at the University of Salford, United Kingdom (UK) proposed changing the curriculum for the undergraduate diagnostic radiography students in order to expose them to more formal research, as part of their normal teaching and learning experience. It was envisaged that such an initiative with suitable materials and support could lead to valuable research outputs from their contributions, but also facilitate the students practice based learning and understanding of key radiographic concepts.

The Research-informed Teaching experience (RiTe) was developed to combine elements of inquiry led learning and research, with level 4 (year 1) undergraduate radiography students exploring the relationship between kVp with a fixed mAs on both the image quality and dose area product (DAP). RiTe was piloted for one week on two separate occasions, using two groups of volunteer level 4 radiography students. Each week consisted of two groups of four level 4 students following an inquiry based scenario using the phenomenon of exposure creep as a trigger.[4] This trigger was used by the students to investigate the relationship between increasing kVp with a fixed mAs on both image quality and DAP using an anthromorphic phantom knee. The students then analysed the data collected and presented their findings at the end of each pilot week. Student and staff feedback from both pilots was extremely positive and RiTe was fully integrated into the level 4 diagnostic radiography teaching and learning curriculum as part of their assessment in January 2011.[5]

* Corresponding author. Diagnostic Imaging, The Clatterbridge Cancer Centre NHS Foundation Trust, Clatterbridge Road, Bebington, Wirral CH63 4JY, United Kingdom. Tel.: +44 151 482 7838.
E-mail addresses: robert.higgins@clatterbridgecc.nhs.uk, robert.h@mac.com (R. Higgins).

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Aim

The undergraduate student experience is crucial to many research educators in better understanding the phenomena of student learning and development.[5] However, despite RiTe being integrated within the level 4 diagnostic radiography learning curriculum, there had been no formal evaluation or research undertaken to examine the students' holistic learning experience of RiTe.

Three core objectives were identified for research. These core objectives would explore the level 4 students' holistic experiences of RiTe and determine whether RiTe helped in the transition of learnt theory into applied knowledge. The final core objective would examine from the students' perspective whether RiTe had the potential to influence their approach to both clinical practice and research.

The research outcomes would also help to inform the development of a questionnaire for subsequent research. This questionnaire would be used to further explore the level 4 student experience of RiTe with a greater population size.

Method

Grounded theory was used explore the students' holistic experience of RiTe as it is a constant comparative methodology that seeks to identify the 'story' of the data being analysed. It also permitted the researcher to choose techniques in their reconstruction of the participants' data to better explore the research outcomes.[6–9]

A focus group was used to explore the students' attitudes, perceptions and feelings about their RiTe experience. A focus group was chosen as the preferred method as it would inform the content of the questionnaire, obtain general background information about the student holistic experience of RiTe and stimulate new ideas.[10,11]

The researcher acted as 'moderator' and a topic plan with a number of 'triggers' was used to guide the discussion (see Table 1). These triggers would enable the participants to share their experiences with each other and help identify any degree of consensus or difference of opinion.[12]

Ethical approval

Ethical approval (HSCR12/12) was granted prior to recruiting students to participate in the focus group and good ethical practice for conducting focus groups was followed. This included the use of informed consent via an information sheet for all participants, and set of focus group guiding principles (See Table 2). All participants were assured of confidentially and anonymity during and after the focus group.[11,12]

Sampling and recruitment

A stratified and purposive sampling approach was used in recruiting students to participate in the focus group. The participants would all share a common characteristic, in that they all had experienced RiTe as level 4 students. The programme leader approached the five RiTe level 4 student groups. There were eleven students within each of these five RiTe groups, and from each group the programme leader sought to identify those students who would be willing to participate in the focus group and share their experiences of RiTe as part of a research project.

From those students willing to participate, the programme leader identified eight participants from across the five RiTe groups. Selection was based on their suitability in offering their feedback and experience and also their availability to participate as part of a homogenous focus group. The literature varies on the optimal size of a focus group, but typically it will consist of between four-twelve participants, with the minimum recommended number of focus groups being two (depending on the issue being investigated and the amount of diversity required).[10,11,13] However, due to the limited number of suitable participants selected, which was due in part to student timetable issues coinciding with the focus group, only one focus group was used in the research. As a consequence selection bias has to be acknowledged as a possible source of systematic error, limiting the generalisabilty of the research, but not its internal validity.[14] It was envisaged that the focus group would last between 60 and 90 min. All eight participants invited to the focus group attended.

The programme leader played an important role with the research design development. Having insider knowledge, they were able to contribute to the management and logistics of the research. However, they were not involved with the design of the research data collection tool, the focus group itself or the data analysis.

Table 1
Topic plan with focus group triggers.

1. Tell me about your experience of RiTE, please think broadly (holistically) when responding to this question
2. What helped you to learn during RiTE?
3. What (if anything) hindered your learning with RiTE?
4. What did you learn during RiTE?
5. Do you think your experience within RiTE will influence your approach to clinical practice?
6. What about student involvement with research?

Table 2
Focus group guiding principles.

1) Only one person talks at a time.
2) Confidentiality is assured – "What is shared in the room stays in the room".
3) It is important for us to hear everyone's ideas and opinions. There are no right or wrong answers to questions – just ideas, experiences and opinions, which are all valuable.
4)It is important for us to hear all sides of an issue – both the positive and the negative.
5) Invite participants to establish their own ground rules or guiding principles for the discussion.

Data collection

Data was collected using a digital audiotape to record the focus group participants' views and field notes were also taken to provide a permanent record of the researcher's interpretation of what was said and to act as point of reference during the data analysis.[15] The focus group explored the student experiences, attitudes and perceptions about RiTe and lasted for 60 min. All responses were recorded in an anonymous basis and each participant was given time to make a comment without interruption of other focus group members.

Data analysis

The focus group recording was transcribed verbatim. Each line within the transcript was given a line unique number so that data could be located quickly and easily. Informal notes and comments from the field notes were also included as part of the analysis following transcription.

Open coding was used to conceptualise and categorise the data. Four core categories were identified following open coding – *the student holistic experience of RiTe*, *student learning and acquired knowledge following RiTe*, *changes in student clinical practice following RiTe* and *changes of student perception of research following*