



University of
Salford
MANCHESTER

The preparedness of traditional and problem-based learning (PBL) Salford radiology graduates for their role as healthcare professionals

Mackay, S, Evans, J and Cunningham, L

Title	The preparedness of traditional and problem-based learning (PBL) Salford radiology graduates for their role as healthcare professionals
Authors	Mackay, S, Evans, J and Cunningham, L
Publisher	University of Salford
Type	Monograph
USIR URL	This version is available at: http://usir.salford.ac.uk/id/eprint/2025/
Published Date	2003

USIR is a digital collection of the research output of the University of Salford. Where copyright permits, full text material held in the repository is made freely available online and can be read, downloaded and copied for non-commercial private study or research purposes. Please check the manuscript for any further copyright restrictions.

For more information, including our policy and submission procedure, please contact the Repository Team at: library-research@salford.ac.uk.

TLQIS Final Report Graduate Preparedness Project

By Professor Stuart Mackay. Health Care Professions

12th June 2008

Introduction

The background to this report will present the issues surrounding the radiography curriculum including the reason for converting to problem-based learning and the expected curriculum outcomes.

The main aim of the BSc (Hons) Diagnostic radiography curriculum is to facilitate the development of competent practitioners in the field of Diagnostic Radiography who have attained the required professional, academic and personal attributes that are required for current professional practice. In order to achieve this, the programme is developed using the views of employers, educationalists and other stakeholders along with policy documents (QAA Benchmark statements 2001, Skills for health 2002, Health Professions Council Standards of proficiency 2003) and research (Williams and Berry 1997). These guide programme developers and keep the programme focussed to the needs of the service. Graduates should be able to perform well in a wide range of areas including interprofessional work, evidence based practice, knowledge of the personal and professional scope of practice, use of information and communication technology, and thinking logically and systematically.

In addition there has been guidance about the pedagogical approach that might facilitate this aim and Problem-based learning has been suggested as an essential means to deliver higher education in the next century (Engel 1991). Many benefits are claimed by proponents of PBL such as that it encourages deep rather than superficial learning (Lewis and Buckley 1992); supports the need for continuing professional development (Schmidt 1983); enables productive collaboration in groups or teams and promotes critical & creative thinking (Engel 1991). A recent systematic review and meta-analysis of the effects of PBL by Dochy et al (2003) showed that the skills (i.e.

the application of knowledge) of students from PBL curricula are significantly better than those from traditional curricula.

Rationale

So PBL curricula which are focussed by educationalists, stakeholders and service guidelines and delivered using PBL pedagogy should produce graduates with knowledge and skills that make them better prepared for the demands of the job than graduates from traditional curricula. This proposition has been investigated in the context of medical education by Jones et al (2002). They compared the perceptions of the performance of pre-registration house officers from an integrated and modernised PBL curriculum with those from the traditional medical curriculum at Manchester Medical School. Overall the new curriculum was rated higher than the traditional one and the graduates as better prepared for their role. Some examples of the competencies where the PBL graduates rated themselves highly were team working, understanding the purpose and practice of audit, peer review and appraisal, coping with uncertainty, obtaining valid consent, suturing and venepuncture.

The methodology adopted for this published study will provide a useful framework for this planned study. However Jones et al (2002) used a purely quantitative analysis which limits the scope and value of the research to developing the curriculum. This planned study will incorporate a qualitative element to provide richer data from both graduates and work supervisors regarding the strengths and weaknesses of graduates preparedness. This will give the work greater utility for optimising the radiography curriculum.

An unpublished study by Krogh and Rasmussen (2003) also looked at the effects of PBL curricula on employment. They surveyed seven thousand Masters graduates and their employers from two Danish universities over a 10 year period both of which use problem-based learning curricula. The graduates were asked about the value of their educational experience and the knowledge and skills gained from this to their first and subsequent employment. The survey identified a number of useful skills and competencies they had developed as well as several in which they were deficient. Interestingly, the study also identified some knowledge and skills which they had gained at university but appeared to be superfluous to the requirements of their job.

One of these was general theoretical knowledge. This is something that the integrated radiography PBL curriculum has attempted to reduce in favour of knowledge which graduates would use as a modern radiographic practitioner. The second area of superfluous knowledge and skill was what the authors called '*...methodological qualifications on problem-based project work.*' Presumably this relates to some of the skills they developed whilst undertaking problem-based learning. This planned study will therefore identify the areas of the curriculum which have been perceived as valuable to the new graduates as well as those which have not and this information fed into the PBL curriculum.

Programme details

The traditional BSc (Hons) Diagnostic radiography curriculum began in 1996 and had a central ethos of a lecture and tutorial based programme with some minor elements of problem oriented study within it. The programme was subdivided into subject areas such as anatomy, physics, radiographic techniques etc. These were delivered as separate modules. The programme was reviewed and revalidation in 2002 to become a fully integrated problem-based learning curriculum. The central ethos is student centred PBL and is based upon the European model described by Barrows (1996). Triggers are constructed to reflect real world problems or issues, last for one week and introduce students to new material. Fixed resource sessions are delivered to support each trigger. The PBL groups are small with 7-10 students in each and a facilitator takes responsibility for the group learning for one semester. The students move groups annually.

Original Project Aims, objectives, outcomes and benefits

Aim: To determine whether graduates from a traditional and an integrated PBL radiography programme are prepared for their role as a healthcare professional.

Objectives:

1. Construct a survey instrument, based upon the QAA Benchmark Statements, PBL outcomes literature and views of employers to measure specific skills and competencies required to practice diagnostic radiography

2. To survey and interview graduates from the traditional BSc (Hons) Diagnostic Radiography programme and their work supervisors ¹ six months after qualification
3. To survey and interview graduates from the integrated PBL BSc (Hons) Diagnostic Radiography programme and their work supervisors six months after qualification
4. Compare the outcomes from the integrated PBL vs traditional graduates
5. Identify strengths and weaknesses in the preparedness of graduates and feed these into the PBL curriculum

Anticipated Outcomes and Benefits

- To be able to identify the strengths, weaknesses and non-useful educational outcomes in the graduates preparedness for their role and to make recommendations to optimise the PBL curriculum.
- To assist in enabling graduates to identify their continuing professional development needs
- To consolidate and develop new links with clinical placements
- To disseminate project outcomes and methods within the university and research community

Description

The project progressed fairly well overall. A team was identified to deliver the work and met up regularly to discuss progress. There was a lot of travelling required as students were spread across the country. A considerable amount of time went into setting up the interview sessions and arranging visits to ensure they were mutually convenient. All graduates and their on site supervisors were contacted to complete questionnaires. Then a sample of those graduates and supervisors were again contacted to arrange for the interview part of the data collection. All were happy for their interviews to be taped and they were subsequently transcribed.

¹ A representative of the employer who would be willing to make professional judgements about the Salford graduates

Mathscope was a useful resource when we can to plan and undertake the data analysis. They were extremely helpful with suggestions and tips and helped the team achieve the aims of the analysis. They also help with the write up of the statistical section.

Evaluation

The outcomes of the work were presented at UK Radiological Congress 2005 a foremost national conference in the fields of radiology and radiography. The qualitative data was well received and there were clear messages presented. However the quantitative data demonstrated that there were likely to be some weaknesses in the data evaluation tool (questionnaire) used. This was not fully understood by audience judging by the questions that were asked. Reporting of negative findings at conferences is not always as interesting as positive ones. Nonetheless there was some discussed generated about this at the time and during later informal meeting with delegates.

The ethical requirements of this sort of work were closely followed and ethical clearance obtained for each of the hospitals that were visited. Once Local Ethics Committee chair determined that the work was essentially audit and so full ethical clearance was not needed.

Developments

There were no suitable tools published that could be used to measure the preparedness of the new graduate radiographer for their first job. Therefore this work set out to construct one and develop the validity and reliability of the tool. A Pilot study was undertaken and the face and construct validity of the instrument was improved. The questionnaire was modified to take account of these improvements. However it was still only possible to provide a basic level of validity and reliability within the level of resource of the project.

There was initially a lack of response to the postal questionnaire. Therefore this was followed up with a letter and then a personal telephone call to the respondents to politely request the return of the questionnaire. This continual reminding process eventually yielded an excellent response rate of 93.5%.

The semi structured interviews that were planned were carried out by three different members of staff. Therefore to ensure we were providing a similar set of questions we composed an Interview Schedule in which the order and type of questions as well as introductory statements and caveats were standardised. This help to give us confidence that we were involved in similar enquiry environments for the respondents.

One of the co-researchers in the project was fairly new to research and particularly to the style of qualitative approach that was selected for this piece of research. This was a phenomenological analysis and general semi structured interviewing approach with the use of features such as bracketing and the exploring of the world from the respondents point of view, trying to see the world as they saw it. This required some training for the co-researcher which was provided by the project lead who had used this technique in his PhD work.

Consideration of how the project developed from the original bid

The work did not require much modification from the original detailed bid. Other than the issues mentioned in the previous paragraph.

Transferability

The data produced from this work was extremely useful and timely as the BSc (hons) Diagnostic Radiography was to undergo its quinquennial review the following year. The data that was most useful was the qualitative comments where it was noted that there needed to be some further development of the programme or curriculum in order to meet the aspirations of the students and employing/supervising radiography staff. Several curriculum issues were identified which were fed into the programme review. The way that this data was used was to present it at programme team meetings to the

programme team as well as to the current and future employers of our graduates. The work highlights aspects of practice that were changing quickly and that many of the occupational standard documents such as the QAA Benchmark standards, Health Professions Council were not able to keep up with. Dissemination of the work was also undertaken outside of the university with an article accepted for publication in an international peer-reviewed journal 'Radiography' (Mackay, Anderson and Hogg 2007) and at the national conference UK Radiological Congress 2005 (Mackay and Anderson 2005).

Discussion of less successful elements

There were some staffing problems with one member of the research team delivering less than others and then leaving the team and the university altogether. This led to a delay in the completion of the project which had to be extended beyond its original timescales. However the project leader undertook a greater amount of the project than was originally anticipated and encouraged other member of the team to scale up the number of hours they gave to the project. The team response to this and this helped the project to be completed and to meet the original aims of the project albeit at a slightly letter time.

The lack of a validated questionnaire meant that work had to be undertaken to create a valid and reliable tool. A whole project could have been undertaken on just developing this tool. In the end an adequate tool was produced but a lack of confidence in its validity and reliability was a detrimental aspect of the project. It is suggested that this aspect of the work should be completed prior to further work which relies on this type of tool for the veracity of its data. Even though production of this 'survey tool' was originally an aim of this study insufficient resources were available within the project budget to produce the quality tool required.

Some respondents failed to fully comprehend some of the questions in the questionnaire. This was not evident till the interviews took place and some of the respondents were asked to elaborate on some of their responses to items in the questionnaire. These questions which were intended to measure practice were often broad questions e.g. competence in the use of a computer. This broadness of such a

question prevented some respondents from applying this to specific aspects of their clinical practice. There were also some questions which were ambiguous and some respondents discussed obtuse issues which were not linked to the original topic of the question.

Reflection and conclusion

This project was successful in many ways including to inform curriculum development at a key time for the programme - revalidation, to provide measurable research outcomes which contributed to the research output of the Centre and Institute and promoted the university to our external partners as they were able to see that the university valued the clinical work of a radiographer, the work that they were doing. However it did not contribute greatly to the body of knowledge on PBL as the results of the study were not able to provide strong evidence for or against the contribution of PBL towards curriculum outcomes for health professionals. In future work it would be worth spending time and resources in developing and validating any tools that are to be used to measure curriculum or educational outcomes e.g. questionnaires. This will enable higher quality work to be produced with greater confidence in the findings. On balance this TLQIS study has been beneficial.

References

- Barrows H.S., (1996) Problem-based learning in medicine and beyond: a brief overview. In : L.Wilkerson and W.H. Gijsselaers, Editors, New Directions for teaching and learning, Nr68, Jossey-Bass Publishers, San Francisco, pp3-11.
- Dochy F., Segers M., Van den Bossche P., and Gijbels D., (2003) Effects of problem based learning: a meta-analysis, Learning and Instruction, vol 12, no 5, pp533-568
- Engel C. Not just a method but a way of learning, Chptr 3 in The Challenge of problem-based learning Boud D. & Feletti G. (eds) (1991) Kogan Page, London
- Cohen L. & Manion L. (1994) Research Methods in Education 4th ed, Routledge, New York.
- Failla, S, Maher, M.A. and Duffy, C. A. (1999) Evaluations of graduates of an associate degree nursing programme. *The Journal of Nursing education*, Vol 38, Issue 2, pp62-68.
- Health Professions council (2003) Standards of proficiency: Radiographers, HPC, London
- Hycner R.H. (1985) In Cohen L., and Manion L., Research methods in education, London, 4th edition, London, Routledge, 1994, p292
- Jones A., McArdle P. J. O'Neill P.A., (2002) Perceptions of how well graduates are prepared for the role of pre-registration house officer: a comparison of outcomes from a traditional and an integrated PBL curriculum, Medical Education, Vol 36, pp16-25
- Krogh L. & Rasmussen G., (2003) The contemporary and future criteria for employability for Masters and the university response: An Analysis built on data from two Danish Universities, Paper for the Joint AIR and EAIR seminar: Workforce development and Higher education, Aalborg University, June 13-14 2003 (Unpublished)
- Lewis M.E. and Buckley A. The role of evaluation, in Kong M & Mellis G. (eds) (1992) Development of a problem-based learning programme within a traditional school on medicine, Annals of community-oriented education, vol 5 pp 223-234
- Mackay SJ, Anderson CA , How well prepared are radiography graduates to deliver the radiographic service upon qualification?, UK Radiological Congress, 6-8th June 2005, Manchester, UK
- S.J. Mackay, A.C. Anderson and P. Hogg , Preparedness for clinical practice – perceptions of graduates and their work supervisors, *International Journal of*

Radiography, in press 2007 (corrected proofs available online at [doi:10.1016/j.radi.2007.05.001](https://doi.org/10.1016/j.radi.2007.05.001))

Polit D.F. and Hungler B. P. (1991) Nursing Research Principles and Methods 4th Ed. Lippincott, Philadelphia.

Quality Assurance Agency (2001) Benchmarking for Diagnostic Radiography, www.qaa.ac.uk accessed 16.1.04

Skills for health (2002) www.skillsforhealth.org.uk

Schmidt (1983) Problem-based learning: rationale and description, Medical Education, vol 17 pp 11-16.

Vanetzian, E. V. and Higgins, M. G. (1990) A comparison of new graduate and evaluator appraisals of nursing performance. The Journal of Nursing education vol 29, Issue 6, pp269-275.

Williams P.L., and Berry J., (1997), Competent to practice? A report on the role of newly qualified diagnostic radiographers, Department of Radiography, University of Salford.