Development of information skills within the Masters in Research

(MRes (Health and Social Care)), University of Salford

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Rationale and background

Access to information for teaching and learning has reached unprecedented levels due to the explosion of the Internet. Within healthcare, information can be accessed via a range of sources including electronic databases via the World Wide Web (WWW). Students need to access this information to complete coursework, undertake research and once qualified within the context of evidence based practice. Although students may have experience of using IT and web technology they are rarely taught information skills. This can result in information being found via chance (Hall and Dalgleish, 1999), the possibility of missing important information, and frustration in using technology that should make information retrieval easier. However with appropriate training, students can efficiently conduct thorough and systematic literature searches essential for robust and quality work. It is therefore necessary that information skills be taught to students within the Faculty of Health and Social Care.

The Teaching & Learning Quality Improvement Scheme (TLQIS) awarded a grant to staff at the Health Care Practice Research and Development Unit (HCPRDU), University of Salford to develop an innovative training course to provide students within the Faculty of Health and Social Care with literature searching skills. The sessions were originally planned as part of the evidence based health module of the MRes in Health and Social Care. The delayed start date of the MRes led to agreement being sought from the Teaching and Learning Sub Committee to pilot the training course on a group of healthcare practitioners undertaking the HCPRDU *'Doing Evaluations of Practice'* programme (HCPRDU, 2002). A report of the pilot evaluation was submitted to the Committee in December 2001 (Grant et al, 2001).

This report builds on that interim report, outlining the delivery and evaluation of training sessions delivered as part of the MRes course that commenced in January 2002.

Objectives

The modified objectives for this project, agreed in consultation with the MRes course development team and the Teaching and Learning Sub Committee, were:

1. To develop one session of theoretical and one session of web based practical literature searching skills training
2. To evaluate the sessions to determine their usefulness and effectiveness in improving literature searching skills

Objective One

Two sessions on literature searching skills development and practice were facilitated on the MRes (Health and Social Care) course in February 2002. The first session introduced participants (n=21) to the theories of literature searching (formulating a search question; selecting search terms; building up a search strategy; limiting searches) via lecture (including an online 'live' demonstration of techniques using a computer, data projector and screen), interactive discussions, and guided hands-on practice using the interactive web based resource. Participants were given 'between session' exercises to reinforce and build upon knowledge gained during the first session (advantages/disadvantages of a range of information sources; accessing information in their local organisation; developing a search plan; and searching the Internet) that formed the initial group work of the second session. This session, attended by 13 participants, incorporated a question and answer session of issues arising from the first workshop. Participants were also given the opportunity - based on their confidence, experience of searching, and personal preference - to choose whether to complete or revisit the interactive web based resource, to repeat the exercises on alternative databases (possibly using a different search interface e.g. Silverplatter/Webspirs), and/or undertake their own searches in connection with course assignments. Participants were able to access the interactive web site at any

time between the first training session and the completion of their end of year assignment.

Additionally, participants could request feedback on their searches and obtain general advice on the development of searches prepared as part of their course assessment.

Participants on the MRes course were from a range of backgrounds e.g. nurse, university lecturer, hospital consultant etc., and attended the sessions from a range of perspectives e.g. research student (including PhD students), external students, university staff etc.

Objective Two

The sessions were evaluated using two questionnaires. The first was a pre-validated tool to assess the levels of learning achieved as a result of a literature searching training session. The second questionnaire explored the participants self perceptions of levels of learning.

Questionnaire One

An adapted tool to assess levels of searching competence was developed for use with the 'OVID' search interface (see Appendix One) based on a tool by Rosenberg et al (1999) for use with the search interface 'Webspirs'. This tool is scored on a scale of 1 –16, with a point being awarded according to the number of features used appropriately. Further points were also scored for retrieving a manageable set of references, and if the most relevant reference for answering the search question has been identified. Pre- and post- session searches were undertaken by participants in one of two subject areas: the effectiveness of nursing interventions for smoking cessation or the effectiveness of rehabilitation after stroke. These, and end of year assignments, were scored using the modified Rosenberg tool.

Questionnaire Two

A questionnaire, previously piloted on a wide range of similar training sessions, was administered at the end of the second session (see Appendix Two). The questionnaire aimed to obtain participants views on the course together with their opinions on how

their knowledge, skills and confidence in searching had improved. Participants were also asked to list three likes and dislikes about the interactive web based resource.

Findings

Questionnaire One

Thirteen assessments were usable (that is, participants completed and returned the pre- session evaluation, including both their search strategies and search results, and at least one of either the post- session search or course assignment). The following results are based on these thirteen assessments.

All thirteen participants had enhanced their basic literature searching techniques (see Table One).

Table One: Skills Assessment of MRes Students

	Mesh or Boolean	Mesh and Boolean	Mesh and Boolean and Systematic	Strategy Includes Items Other Than Mesh and Boolean	Strategy/End of Year Assessment Not Submitted	
Pre training	7	2	2	2	0	*13*
Post training	2	3	6	0	2	*13*
Assignment	1	-	7	2	3	*13*
	10	*5*	*15*	*4*	*5*	*39*

Prior to the training sessions, seven participants (54%) demonstrated an understanding of one basic search technique e.g. MESH searching or correct use of Boolean operators. Two participants (16%) had grasped both of these basic search techniques. A further 16% were able to demonstrate their ability to develop a systematic approach to searches, including the use of more advanced search techniques e.g. textword searching and use of the limit function. Following the training session the number of participants who could use basic search techniques correctly and in a systematic way had tripled (46%). Following the assessment of end of year assignments this figure had increased to 54%.

In consolidation of their learning, feedback on search strategy development was requested by seven participants, who were variously referred to particular sections of the interactive web site.

Eleven (85%) participants had improved their overall literature searching skills (see Table Two). Two participants had maintained their scores, one of whom had adopted a more systematic approach to their search. Scores pre- and post- training, and following the end of year assignment indicate an improvement in overall searching skills (mean = 2.8). This was significantly enhanced with guided feedback and referral to the interactive web site (mean = 6.7). The aggregated improvement in pre- and post- session or assignment grades was 5.1.

Table Two: Mean Scores Achieved by MRes Students

	Adapted Rosenberg Score (Scores: 1-16)
Without feedback	
Pre training	4.5
Post training	5.9
Assignment	7.3
Overall improvement	2.8
With feedback	
Pre training	4.6
Post training	6.9
Assignment	11.3
Overall improvement	6.7
Aggregated scores	
Pre training	4.6
Post training	6.5
Assignment	9.7
Overall improvement	5.1

Questionnaire Two

Eight (62%) questionnaires were returned, seven (54%) of which were wholly positive (agree or strongly agree). All respondents believed that the session was useful, well structured and interesting. They also considered that the support material (work pack) was useful and relevant. Five (39%) participants agreed or strongly agreed that the session improved their search skills, and four (31%) that their knowledge of literature searching had increased. Three (23%) participants did not complete this item on their questionnaire. Seven (54%) participants believed their confidence in searching was improved, five (39%) of who strongly agreed with this

statement. One (8%) participant was undecided in each of these areas. Participants appear to view their skill development more negatively than was demonstrated using the adapted Rosenberg et al assessment tool. However the numbers of participants regarding this are too small to draw any definitive conclusions.

As with feedback received from the participants of the pilot group (Grant et al, 2001), the interactive web resource was well received. This was reflected in the following comments:

- Clear
- Easy to follow
- Able to work at own pace *(3 participants)*
- [It] gave me an opportunity to test out new skills *(2 participants)*
- It will provide an opportunity for me to practice literature searching
  (3 participants)
- Enjoyed this… feel more confident and feel I'm searching more efficiently
- Interactive
- Relevant
- Very useful *(3 participants)*

Participants did consider there to be some room for improvement, including:

- More time
  [Participants had the opportunity to utilise the interactive web resource in both workshop and at all times outside these facilitated sessions]
- Even more simpler, step by step, instruction
- Relate to own research project
  [Tailoring the web resource to the unique research question of each participant would not be feasible. During the theory workshop search techniques are introduced to participants using a research topic proposed by the group, whilst generic health scenarios are used to illustrate these methods on the interactive web resource. Participants have an opportunity to search for their own question after being led through a structured example]

One participant also commented that whilst it may be difficult for people who have never used a computer before or the Internet, they considered the site to have been made a simple as possible, and did not require any changes.

Discussion

Development Issues

<u>Accommodation</u>

Both sessions took place in a computer suite within the University of Salford library. The computer suite was wide (from left to right), air conditioned, contained 48 up-to-date computers, had a data projector on each side of the suite, and incorporated two broad pillars. Although a purpose built facility, a number of problems were experienced with this accommodation. These included acoustics, layout and security.

1. *Layout*

    All participants had a clear view of the data projector screens on either side of the room, that is, not obscured by the two pillars in the computer suite. However, feedback indicated that they could not always see the facilitator. Again, this may have implications for all participants, including those who rely on lip-reading to fully participate in a training session.

2. *Security*

    Although it was possible to book the computer suite until 8.00pm, the library closes at that time, and the group were asked to vacate the room early in order to secure the accommodation over night. This was not known until 15-20 minutes before the end of the first session, though it could be factored into the scheduling of the second session.

3. *Acoustics*

    Unfortunately there were no microphones available for either of the two training sessions. Although the acoustics of the computer suite were checked prior to the session, feedback indicated that there were problems in ensuring that all participants could hear the facilitator. It is known that some students in the group have hearing difficulties/are hard of hearing that could have influenced this

response. However, these comments have been made informally by participants at previous workshops organised in the same computer suite, particularly in relation to the noisiness of the air conditioning.

Based on the three issues of layout, security and acoustics, it is recommended that an alternative venue be secured for future sessions (possibly the bookable computer suites on the 8th Floor of Allerton Building).

Group Size

It was previously mooted that the use of the web based resource might enable larger groups to be taught in a single session (currently a maximum of six students per facilitator is specified, to ensure each participant received an appropriate level of individual support). However, several participants expressed a preference for smaller group sessions. It is possible that the problems associated with the accommodation (outlined above), may have contributed to participant preference. It is recommended that this should be monitored in future sessions.

Scheduling

During the first session, several participants gave their apologies for not being able to attend the following week. The primary reason for this was the half term break in schools within Manchester. This may have accounted for the attendance levels at the second session (n=13; 62%). Additionally, the composition of the group, in which less than half of participants (47%) were obliged to submit assessments or end of year assignments, may also have contributed to the lower than expected levels of data collected.

Transferability

The introduction of a theory and web based approach to skills development, in contrast to a theory and hardcopy workbook approach, was achieved with relative ease, and participants appeared to engage with the technology and materials effectively. The web based approach also facilitated participants with the opportunity to revisit the theory of literature searching and practical exercises, and reinforce their learning through self-assessment via the quizzes, at their convenience.

In the interim report it was suggested that the interactive web site could be used as a stand-alone training package for participants not attending facilitated sessions. Whilst this maybe feasible, findings appear to indicate that the use of this resource to complement taught sessions and, in particular, in conjunction with guided feedback from facilitators in the development of participant key skills development have a greater impact on searching competence.

At this point in time, the interactive web based resource is primarily focused on health related resources, and incorporates a range of health focused scenarios. However, given the apparent success of this type of resource, it is considered feasible for its relatively easy adaptation to other specialities e.g. 'Arts and Media' or 'Business and IT'. This could be undertaken by subject specialists in these fields, adapting the practical exercises to databases relevant to their speciality, and incorporating appropriate examples and quizzes.

From a technical perspective, the web based resource enables self assessment by users of the site. However, the technology used to develop the site (html web pages utilising hypertext links) does not enable facilitators to monitor use of the site or scores achieved through the quizzes. Since the initial development of the literature searching resource, Salford University has purchased 'Perceptions' software that could facilitate this type of remote monitoring. If further funding were obtained, the web based resource could be modified to enable the monitoring of the web resources contribution in the key skills development of non-attendees to facilitated training sessions.

Reflections and Conclusion

The project achieved the aims of the original bid to develop and evaluate the effectiveness of improving literature searching skills via theoretical and web based skills training. In addition, in accommodating the delay to the start of the MRes enabled the use of the interactive web site with a second pilot group, adding further weight to the findings of this project.

This report incorporates the findings of 13 of the 21 participants on the course representing a relative small sample size. Unfortunately the remaining eight participants did not submit evaluations either for this project, or as part of the wider training programme. However, the results repeat those of the evaluation programme pilot group. MRes participants generally took less time to undertake the practical session via the web based resource, than using print based worksheets, and appeared to require less facilitation. This was despite the content being identical in both the printed and web based practical exercises.

This evaluation has not been able to draw clear distinctions between the contributions made by taught sessions in the development of literature searching skills and knowledge, from those acquired as a result of the interactive web site. However, participants appear to continue to enhance their skills base pre- and post- training sessions, particularly those who sought feedback and were redirected to sections of the interactive web resource. This improvement may therefore be attributable to the on-going access to the interactive web based resource. A survey of participant use of the site between the first training session and the completion of their assignments would provide some clarification of this situation.

A relationship between facilitator feedback and participant referral to designated sections of the site appears to exist in the improvement in searching skills, suggesting a value in the web based resource use as part of a wider research skills development programme or module. The interactive web based resources is now freely available, and can be accessed by staff and students within – and outwith – the University.

It is recommended that this web based resource be promoted throughout the University, particularly within the Faculty of Health and Social Care (FHSC). The resource is currently profiled within the Health Care Practice Research and Development web site, and similar links could be made from the FHSC and the Institute of Health and Social Care Research (IHSCR) web pages. The Educational Development Unit may also wish to encourage the widening of the profile of this resource with links from the web site of the University of Salford Information Service.

For University of Salford staff this resource has the potential to make positive contributions in the key skills development of students. Staff may also find the resource of value in supporting and consolidating their ongoing professional development in relation to literature searching skills.

Literature Searching Web Based Resource: www.fhsc.salford.ac.uk/hcprdu/interactive

References

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Hall R and Dalgleish A (1999) Undergraduates experiences of using the World Wide Web as an information resource, *Innovations in Education and Training International*, 36 (4): 334-345.

HCPRDU, University of Salford (2002) Doing evaluations in practice. Web site: www.fhsc.salford.ac.uk/hcprdu

Rosenberg WC, Deeks J, Usher AL et al (1998) Improving searching skills and evidence retrieval, *Journal of the Royal College of Physicians of London*, 32(6): 557-563.

Appendix One – Questionnaire One

LITERATURE SEARCH EVALUATION

Assessment Sheet

Student Name: …………………………………………………………………….

		Pre Theory	Post Theory
	A: Free text		
1.	Use of free text terms		
	B: Sensitive free text		
2.	Use of synonyms		
3.	Truncation		
4.	Wildcard		
5.	Use of Boolean operator "or"		
	C: Thesaurus search		
6.	Use of MeSH terms		
7.	Use of specific terms from question		
8.	Use of explode		
9.	Use of Boolean operator "and"		
	D: Limiters		
10.	Use of limiters		
11.	Search for review/rct/metaanalysis or other ebp		
12.	Use of combination of Boolean operators		
13.	Use of other effective features (e.g. subheadings)		
	Yield		
14.	Systematic approach to search		
15.	Number of articles (manageable number – 50 or less)		
16.	Relevance score of best (usually systematic review or other high quality evidence)		
	Total Search Score (Score 1 for use of each item)		

Comments

Appendix Two – Questionnaire Two

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**Finding Information for Research
and Evidence Based Practice**

Evaluation Form

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The session today was developed to help you improve your information skills. To help us decide whether we can make improvements to the course, we would be grateful if you could complete the following evaluation form.

Many thanks. Maria J Grant, Alison Brettle, HCPRDU

Please tick to indicate to what extent you agree with the following statements.

	Strongly agree	Agree	Undecided	Disagree	Strongly disagree
1. The session was useful/relevant to my needs					
2. The session was interesting					
3. The session was well structured					
4. The session was pitched at the right level					
5. The facilities provided were good					
6. The support material was clear					
7. The support material was useful/relevant					
8. The session improved my knowledge of literature searching					
9. The session improved my database searching skills					
10. I feel more confident about my ability to carry out a literature search in the future					
11. Overall the session was worthwhile					

Please name three things you like about the web based session:

1.

2.

3.

Please name three things you would change about the web based session:

1.

2.

3.

Do you have any further comments about the web based session?

Name …………………………………………………………………………………………

Thank you for completing this questionnaire