

21st century research training on the Internet: let's get serious about an e-PhD?

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Abstract

Technological advances and marketplace changes suggest that unexploited opportunities exist to develop research training mechanisms that could support new blended learning and new internet-based distance learning degrees such as e-MRes, e-MPhil and e-PhD.

Introduction

Most academic institutions have experienced substantial changes over the last decade which have included a proliferation in the number of Taught Masters Degree (TMD) programmes i.e. MAs and MScs. Technological educational innovations have also involved the subsequent conversion of established TMD courses, or/and the development of new TMD programmes, to offer blended or internet-based distance learning equivalent e-TMDs i.e. e-MAs and e-MScs.

This latest switch towards the development of on- and off-campus internet based e-learning degrees is doubtless intended to build on earlier expansions and past successes. It is intended to address the challenges of shifting market demands, together with the need for higher educational institutions to take a more proactive stance, in which fresh business opportunities are sought, both at home and abroad, and within a wider market context. Numerous e-TMD programmes and courses, nevertheless, are often restricted to the use of past teaching formats that are applied in a similar manner to those which prevailed in their non-internet based predecessors. The older processes and procedures were designed to suit a 'single facilitator - multiple student' model; that functioned in a cost-efficient manner, where teaching and learning was based on coursework-centred or exam-centred methodologies, and which placed a strong reliance on content-rich mechanisms and resources.

Some e-TMD programmes might go beyond the traditional model, and offer what is called a virtual learning environment that can support both on- or off-campus activities: e.g. internet-based learning support tools in the manner of a 'course management package' such as WebCT or Blackboard. This software provides excellent opportunities for the secure organisation of course material and a dedicated platform for text-based communication protocols that extend from the provision of email, chat room and discussion board facilities, to the construction of gradebooks and quizzes. The level of associated interactive communication that can be supported in these more advanced teaching environments is richer than that achieved by the simple translation of traditional materials into an e-based format. However, the level of interaction that can occur still falls a long way short of the experience that students gain through face-to-face contact. Such interactions are necessary both for checking understanding and for cementing the social relationship between student and teacher. These issues become particularly acute as we try to promote more critical and reflective approaches to learning, such that the design and effective use of internet tools which can support the curriculum in these key areas represents one of the main challenges for e-learning in the higher education sector.

Moving from e-learning to e-training

There are significant differences between a Taught Masters Degree (MA; MSc) and a Post-Graduate Research Degree (MRes; MPhil; PhD) both in terms of process and content, and in terms of operational matters related to research supervision and research training procedures. As a result, few, if any, e-MRes or e-MPhil or e-PhD Post-Graduate Research Degrees have so far been created. This is largely due to a lack of suitable software environments that can handle or/and resolve the important 'social' aspects of student-teacher interaction(s). However, the 'e-learning toolbox' is changing, and it may now be possible to move e-learning functionalities into the e-based research training environment. Several 'social software' tools have, for example, been developed in this respect and continue to be investigated in terms of their overall effectiveness for research training purposes: e.g. Hexagon; BuddySpace; FlashMeeting; AliceStreet Conference Center. (See Table 1.)

Table 1: List of software web sites

WebCT	http://www.webct.com/
Blackboard	http://www.blackboard.com/
Hexagon	http://cnm.open.ac.uk/projects/hexagon/
BuddySpace	http://kmi.open.ac.uk/projects/buddyspace/
FlashMeeting	http://cnm.open.ac.uk/projects/flashmeeting/
Alice Street Conference Centre	http://www.alicestreet.com/
Compendium	http://www.compendiuminstitute.org/
D3E	http://d3e.sourceforge.net/
Mind Manager	http://www.mindjet.com/uk/
Mind Genius	http://www.mindgenius.com/

These technological developments are timely, because the mission of the research trainer is also changing. The traditional difference between a Taught Masters Degree and a Post-Graduate Research Degree was often expressed in terms of objectives and deliverables: a research degree was intended to be about conducting 'original research'. It was focused on the production of a substantial thesis which was, in turn, expected to make a 'contribution to knowledge' and to present a position that could be 'defended'. This emphasis has, however, shifted in recent times such that research degree programmes are now expected to have a stronger focus on the more generic aspects of research training and to encompass the development of individual personal qualities and professional research skills for the workplace.

Metcalfe et al. (2002) report that training in research skills and techniques is now the key element in the development of a research student, although the provision of wider employment-related skills should not detract from the core objective, which is that research students are expected to make a substantial and original contribution to our existing knowledge in their specialist subject area and that such findings would, in most cases, lead to published work. Their list of suggested skills is provided in Table 2.

Table 2: Key Components of Post-Graduate Research Training Programmes (after Metcalfe et al., 2002)**A) Research skills and techniques - to be able to demonstrate:**

- the ability to recognise and validate problems
- original, independent and critical thinking, and the ability to develop theoretical concepts
- a knowledge of recent advances within one's field and in related areas
- an understanding of relevant research methodologies and techniques and their appropriate application within one's research field
- the ability to critically analyse and evaluate one's findings and those of others
- an ability to summarise, document, report and reflect on progress

B) Research environment - to be able to:

- show a broad understanding of the context, at the national and international level, in which research takes place
- demonstrate awareness of issues relating to the rights of other researchers, of research subjects, and of others who may be affected by the research, e.g. confidentiality, ethical issues, attribution, copyright, malpractice, ownership of data and the requirements of the Data Protection Act
- demonstrate appreciation of standards of good research practice in their institution and/or discipline
- understand relevant health and safety issues and demonstrate responsible working practices
- understand the processes for funding and evaluation of research
- justify the principles and experimental techniques used in one's own research
- understand the process of academic or commercial exploitation of research results

C) Research management - to be able to:

- apply effective project management through the setting of research goals, intermediate milestones and prioritisation of activities
- design and execute systems for the acquisition and collation of information through the effective use of appropriate resources and equipment
- identify and access appropriate bibliographical resources, archives, and other sources of relevant information
- use information technology appropriately for database management, recording and presenting information

D) Personal effectiveness - to be able to:

- demonstrate a willingness and ability to learn and acquire knowledge
- be creative, innovative and original in one's approach to research
- demonstrate flexibility and open-mindedness
- demonstrate self-awareness and the ability to identify one's own training needs
- demonstrate self-discipline, motivation, and thoroughness
- recognise boundaries and draw upon/use sources of support as appropriate
- show initiative, work independently and be self-reliant

E) Communication skills - to be able to:

- write clearly and in a style appropriate to purpose, e.g. progress reports, published documents, thesis
- construct coherent arguments and articulate ideas clearly to a range of audiences, formally and informally through a variety of techniques
- constructively defend research outcomes at seminars and viva examination
- contribute to promoting the public understanding of one's research field
- effectively support the learning of others when involved in teaching, mentoring or demonstrating activities

F) Networking and teamworking - to be able to:

- develop and maintain co-operative networks and working relationships with supervisors, colleagues and peers, within the institution and the wider research community
- understand one's behaviours and impact on others when working in and contributing to the success of formal and informal teams
- listen, give and receive feedback and respond perceptively to others

G) Career management - to be able to:

- appreciate the need for and show commitment to continued professional development
- take ownership for and manage one's career progression, set realistic and achievable career goals, and identify and develop ways to improve employability
- demonstrate an insight into the transferable nature of research skills to other work environments and the range of career opportunities within and outside academia
- present one's skills, personal attributes and experiences through effective CVs, applications and interviews

These skills might be present on commencement, could be explicitly taught, or could be developed during the course of their research, and it is expected that different mechanisms will be used to support effective training, as appropriate, including self-direction, supervisor support and mentoring, departmental support, workshops, conferences, elective courses, assessed courses and informal opportunities. This change of focus will create excellent opportunities in which to develop a strong e-learning and content-based component that could be delivered over the internet on a regular basis and be used to supplement the traditional post-graduate research supervision process. Several skill-based tools have been developed in this respect and continue to be investigated in terms of their overall effectiveness for research training purposes: e.g. Compendium [a semantic hypertext concept mapping tool]; D3E [a digital document discourse environment that binds a document to a discussion for individual or collective reviewing], as well as other 'mind-mapping' tools such as Mind Manager and Mind Genius. [Table 1]

Trends and developments in the marketplace

The marketplace for research training is neither static nor stagnant. Recent changes suggest that the development of e-based research training is now essential. In the UK, for example, the national agenda for post-graduate research training continues to evolve and the number of research students has doubled in the last decade (Grad, 2003). However, further increased throughput is required, to meet our current demands and to account for demographic and economic expansion (Roberts, 2002). Further increases are indeed considered to be essential, since future economic and social development and international competitiveness, is dependent upon the level and quality of investment in basic research and research training operations (DTI, 2003; HM Treasury, 1996). Newby (2003) has also noted that massive changes are occurring in the 'marketplace' and that a major part of the recent expansion in post-graduate numbers in the UK has been in terms of part-time students. The same trend is occurring elsewhere in the world. This suggests that the traditional, full-time studentship, taken soon after graduation from a first degree, would no longer be the appropriate answer and that the development of alternative models must be considered.

The post-graduate research agenda is also being shaped by such factors as:

- The financial unattractiveness even of the traditional PhD which is now a major barrier to uptake amongst high quality candidates (Roberts, 2002, Ch. 4).

- The need for the mix of skills that is provided in research training programmes to be broadened to take account of both the long-term career needs of students and the requirements of employers in the academic, industrial and public sectors (HM Treasury, 1996; Roberts, 2002).
- The increasing need to promote mobility of researchers even at the early stages of their careers, both geographically (to take account of the increasing internationalisation of research) and between universities, industry and public sector organisations (to ensure the relevance of research and to fully realise its social and economic benefits) (DTI, 2003; European Commission, 2003)
- The need for life-long learning and continuing career development at all levels in a 'knowledge-based society' (DTI, 2003; STRATA-ETAN, 2003).

In these contexts, the development of e-based approaches to research training would clearly be of relevance in the case of students who had difficulties in attending standard courses, sessions and events (e.g. live at a distance), who do not do their research on campus (e.g. workplace learning, fieldwork, etc.), or who need greater flexibilities in scheduling (e.g. part-time students, mature students with children, etc.). In looking to the future, Fell (2003) has also emphasised the potential importance of developing distance learning and e-based models for the post-graduate sector and has suggested that such developments may be particularly significant given the need for closer collaboration between universities and the business sector - as highlighted by recent Government policy statements (DTI, 2003).

Conclusions

Putting the various arguments together [toolbox; mission; market] it would seem that it is time to extend our pedagogic aspirations and horizons into the educational aspects of skill-focused, e-based research training, as opposed to traditional, content rich, e-based subject-specific teaching and learning undertakings. We need to consider what is taught, how teaching occurs, and how our teaching is assimilated. We also need to develop a coherent plan of action, together with a set of best working practices, for the widespread dissemination of higher degree research training activities over a virtual and distributed international environment such as the internet. The time of the e-based research training programme has arrived.

References

- DTI (2003) *Competing in the Global Economy: The Innovation Challenge*. Dec. 2003
- European Commission (2003) <http://fp6.cordis.lu/fp6/home.cfm>
- Fell, T. (2003) *Challenges for Research SSpervision*. National Forum on Implementing the Roberts' Review Recommendations, p18.
- Grad (2003) *Beyond the White Paper*. Conference held in London, 16.09.03.
- HM Treasury (1996) *The relationship between publicly funded basic research and economic performance*. SPRU.
- Metcalf, J., Thompson, Q. and Green, H. (2002) *Improving standards in post-graduate research degree programmes: A report to the Higher Education Funding Councils of England, Scotland and Wales*. HEFCE Publication No: 2003/01.
- Newby, H. (2003) *The UK Vision for Research Training*. National Forum on Implementing the Roberts' Review Recommendations, p6.
- Roberts (2002) *The Supply of People with Science, Technology, Engineering and Mathematical Skills*. The Report of Sir Gareth Roberts' Review. April 2002.
- STRATA-ETAN (2003) <http://europa.eu.int/comm/research/science-society/women/wir/pdf/tor.pdf>
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