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Pam Moule, Rod Ward and Lesley Lockyer

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Pam Moule

Reader in Nursing and Learning Technologies, Director of the Centre for Learning and Workforce Research, Faculty of Health and Life Sciences, University of the West of England, Bristol, UK

Rod Ward

Senior Lecturer, Faculty of Health and Life Sciences, University of the West of England, Bristol, UK

Lesley Lockyer

Director of Market Intelligence, Faculty of Health and Life Sciences, University of the West of England, Bristol, UK

Abstract

In this paper we present aspects of a study that scoped e-learning implementation in nursing and health science disciplines throughout the UK and explored the factors affecting use. Data related to the use of technologies are presented here. While there are many drivers for the use of e-learning, the current scope of engagement in nursing and health science disciplines is unknown and variations in adoption have not been explored. A postal questionnaire sent to a purposive sample of 93 Higher Education Institutions (HEIs) obtained data from 25 universities (response rate of 28%) related to their uptake and development of e-learning. Questionnaire data was analysed using descriptive statistics. From this, nine HEIs were identified, reflecting a range of levels of engagement in e-learning. Data was collected through 35 staff interviews across the sites. Qualitative data from the interviews was transcribed to allow thematic analysis. Though e-learning adoption and use vary across the sector, the predominant learning and teaching engagement is instructivist and managed through a virtual learning environment. There is limited experimentation with e-learning and teaching use, linked to key centres of excellence and the efforts of 'champions'. It is suggested that a more systematic approach to development and funding is required to achieve enhanced use of e-learning.

Corresponding author:

Pam Moule, Faculty of Health and Life Sciences, University of the West of England, Bristol, Glenside Campus, Blackberry Hill, Stapleton, Bristol BS16 1DD, UK

E-mail: Pam.Moule@uwe.ac.uk

Keywords

e-learning, health sciences, interviews, nursing, scoping questionnaire

Introduction

In the UK a number of government policies have expounded the potential pedagogic contribution of e-learning and teaching (Higher Education Funding Council for England (HEFCE), 2009, 2005; Department for Education and Skills (DfES), 2005; Department for Education and Employment (DfEE), 2003, 1998; Dearing, 1997). Despite this policy background and claims that technology-supported pedagogy is increasing (Adams, 2004), no studies are known to have surveyed the adoption of e-learning in nursing and health sciences within Higher Education Institutions (HEIs) or to have reviewed the factors that have impacted on this (Moule, 2007).

Background

e-Learning is viewed as one way to support the development of professionals that will ultimately contribute to the digital and knowledge-based economy (DfES, 2003). The flexibility and accessibility of such modes of delivery are seen as offering opportunities to meet lifelong learning agendas and support widening participation (Social Care Institute for Excellence (SCIE), 2007; DfEE, 2003; Department of Health (DH), 2001, 2000, 1998; Scottish Executive, 1999). e-Learning and teaching have also been seen as crucial to the support of learners, with the DfES (2003) predicting that by 2013 effective learning would be impossible without access to e-learning.

There are a plethora of terms used to describe what might be seen as e-learning. These include online, web-based and information technology (IT) or information and communication technology (ICT)-based learning. More recently we have seen new terms emerge, such as blended (elements of face-to-face and e-learning), mobile or m-learning and social network learning enabled through Web 2.0 technologies. Several bodies have provided definitions, including, HEFCE which suggests that e-learning is 'any learning that uses ICT' (HEFCE, 2005, p. 5). Broadly, e-learning is the use of technology to support learning and teaching.

The development and use of e-learning in HEIs have been affected by a number of policy papers. The 'National Committee of Inquiry into Higher Education' (Dearing, 1997) identified the central role of IT in improving the delivery and effectiveness of learning and teaching in higher education (HE), making a number of recommendations based on information and communication technology provision, including the development of key IT skills. Following this report a number of strategic developments emerged that suggest the content of the report was not confined to the rhetoric of HE, but is being embedded in its pedagogic culture. Further policy documents from the Department for Education and Skills (DfES) have been influential. 'The Future of Higher Education' (DfES, 2003) suggested that IT would support opportunities for part-time and flexible study and stressed the need for HE institutions to share e-learning materials.

There have also been drives from commissioning bodies in the health care domain to encourage the use of e-learning and teaching. In 2001 the National Health Service (NHS) published 'Working Together – Learning Together: A Framework for Lifelong Learning for the NHS' (DH, 2001), which set out extensive plans for the design and use of e-learning. Recent consultations in nursing education (DH, 2007; Longley *et al.*, 2007) resulting from

the modernisation agenda (DH, 2006) mention the need for technological advances in care delivery to be considered in the curriculum.

Despite the drives to develop and use e-learning and teaching within nursing and health science disciplines, there is limited information regarding uptake, and the factors that affect engagement have not been fully examined (Moule, 2007). However, factors such as organisational strategy, availability of resources, and degree of staff confidence are thought to play a part in adoption (Gilchrist and Ward, 2006). To explore these issues further, this study focused on the development and use of e-learning within HEIs that provide initial undergraduate and continuing postgraduate education for professions within nursing and the health sciences.

Aim

The aims of this mixed methods study were to scope e-learning and teaching implementation in health sciences and practice disciplines throughout the UK and explore those issues influencing implementation and use.

Methodology

The study, conducted across 2007 and 2008, incorporated two phases:

Phase 1: the collection of quantitative data through a questionnaire;

Phase 2: the collection of qualitative data in university sites through semi-structured interviews.

Sample

In Phase 1 a purposive, non-random sample of 93 HEIs, the total number delivering nursing and health sciences education, were identified through the Higher Education Academy Health Science and Practice Subject Centre. The number of HEIs that responded totalled 25 out of 93 (a response rate of 28%). From these 25 responses, nine HEIs from across the UK agreed to be case study sites. Interviews were conducted with 35 staff members. The HEIs approached had indicated a willingness to enter Phase 2 of the study and were selected to reflect a range of levels of e-learning and teaching engagement and development, such as: the number of courses and modules delivered using e-learning; number of students and staff involved in e-learning use; and the range of e-learning applications employed.

Data collection

Before the study began a literature review was undertaken to identify existing data collection tools. A survey tool developed by the Joint Information Systems Committee (JISC)-funded Managed Learning Environment Study and Universities and Colleges Information Systems Association (UCISA) (undated) was adapted for use, with some areas of questions not relevant to the study being removed. The questionnaire was composed of 62 questions covering five aspects addressing the implementation of e-learning within HEIs. These were: e-learning development, e-learning environments, learning implementation, portals and future developments. The 25 responses were coded and the data were entered into a Statistical Package for the Social Sciences (SPSS vs. 13); descriptive statistics and frequency tables were calculated.

Table 1. Case study site participants

Case study sites (sampled from the original 25 questionnaire responses)	Academic staff participants
3	1 Head of Department, 2 programme leaders, 3 senior lecturers
4	1 manager, 1 lecturer
5	4 lecturers, 1 technologist
11	1 Reader, 1 senior lecturer, 1 web-developer
15	3 lecturers, 1 technologist
19	2 lecturers, 1 e-learning lead
20	1 manager, 2 learning technologists
22	2 lecturers, 2 e-learning leads
23	3 lecturers, 2 technologists

Semi-structured interviews (see Appendix 1 for sample questions) were conducted with a total of 35 staff across nine HEIs, selected from the original 25 questionnaire responses (see Table 1). The interviews involved a range of staff engaged in e-learning and teaching development and use, including programme leaders, lecturers and learning technologists. They were conducted by members of the research team not known to the interviewees. The interviews were recorded on the university campuses after signed informed consent had been obtained. The qualitative data obtained was transcribed and thematically analysed, using procedures outlined by Miles and Huberman (1994). Thematic analysis involved reading the data to identify key words and start the process of coding. The coded transcripts were shared among the team members, who agreed areas of consistency across the codes. These became the key themes and sub-categories. The codes were linked to themes and sub-categories in ways that were meaningful.

Ethical approval

The study received approval from the University of the West of England, Bristol, Research Ethics Committee.

Results

Phase 1

e-Learning development. Twenty respondents (80%) stated that the local faculty, department or school supported e-learning and teaching development and use as part of a HEI-wide initiative. Only three respondents had experience of departmental or local initiatives with minimal central integration. Two factors were highlighted as important in supporting e-learning development. Twenty-one (84%) felt there was a need for a committed local 'champion' of e-learning, and 15 (60%) stated that 'technological changes and development' were necessary. Respondents stated that a wide range of staff and students were consulted as HEIs developed e-learning support processes and that library staff, learning resources staff and IT support staff were the main support for staff developing e-learning.

The drivers deemed most important in underpinning e-learning development were: 'Enhancing quality of learning and teaching' (15 respondents, 60%), 'Improving access to

Table 2. Processes, services and systems to support learning and teaching being used now

Process	No.	%
<i>Student access to library/learning resource centre (LRC)</i>		
Students can access the library catalogue and electronic resources from one common interface	20	80%
<i>Monitoring of students' use of online resources</i>		
Individual staff can choose and are able to monitor students' use of online resources	17	68%
<i>Tracking students' attendance</i>		
Attendance data is tracked manually	15	60%
<i>Module selection</i>		
Choice of elective modules made using paper forms	14	56%
<i>Recruitment/application outside the Universities and Colleges Admissions Service (non UCAS)</i>		
Prospectus can be viewed and simple enquiries can be made online	14	56%
<i>Personal Development Planning (PDP) transcripts</i>		
Transcripts only available in paper format	14	56%
<i>Signing on to access e-learning resources and environments</i>		
Students access all e-learning resources and environments using a single user name and password	15	60%

learning for part time students' (14 respondents, 56%) and 'Improving access to learning for students off campus' (13 respondents, 52%).

e-Learning environments. Respondents were asked to provide an assessment of current processes, services and systems that supported learning and teaching in their institutions. Table 2 shows the most frequent responses made.

Respondents were asked about their future aims to develop online processes, services and systems to support learning and teaching. Fewer respondents answered this question, and only three aims were identified by over half the respondents. The three areas were:

'Outside of the Universities and Colleges Admissions Service (Non UCAS) Recruitment and Application Processes', where 60% of the respondents aimed to allow potential students to view online prospectuses, apply electronically and then track their applications online.

'Accessibility of resources for students and staff with a wide range of access needs', where 56% of the respondents aimed to organise their online systems to support different learning and access needs.

'Monitoring of students' use of online resources', where 56% aimed to be able to monitor students' use of online resources so staff could intervene if there were difficulties or an inappropriate use.

Learning implementation. Twenty-four respondents (96%) stated that they currently used a virtual learning environment (VLE) that offered the ability to provide student information such as PowerPoints, and had a discussion board and virtual classroom for online meetings and discussions in real time. The highest proportion (52%) used Web CT, a well-known proprietary brand that is now part of Blackboard (<http://www.blackboard.com>). Fourteen respondents (56%) stated that some of their modules were web-supplemented, and six (24%) ran fully online modules.

Respondents used e-learning applications in a variety of ways (see Table 3), with access to course material and web-based learning resources highlighted by all of the respondents.

A range of e-learning technologies were used in the HEIs (see Table 4). E-mail, discussion boards, CD-ROMs and DVDs were used by the majority. The provision of e-learning technologies spread from undergraduate to master's level and covered all health and social care professional disciplines.

Portals. Nineteen (76%) of the responding HEIs had institutional portals, 17 (68%) gave access to local and remote information resources, and 16 (64%) used a personalised single point of access for internal online resources, while 13 (52%) also provided access to external online resources through this single access point. Thirteen institutions (52%) maintained and developed their portals through central IT services.

Table 3. Uses of e-learning applications

	Number	Percent
Access to course material	25	100%
Access to web-based learning resources	25	100%
Problem-based learning	20	80%
Peer support	19	76%
e-Assessment	17	68%
Collaborative working	17	68%
Assignment submission	17	68%
Formative assessment	17	68%
Access to multimedia resources, including simulations and games	15	60%
e-Portfolio	14	56%
Online student presentations (individual and group)	7	28%
Learning design	7	28%

Table 4. e-Learning technologies used

	Number	Percent
Email	24	96%
Discussion boards	21	84%
CD-ROMs	21	84%
DVDs	20	80%
Online videos and sound	16	64%
Blogs	11	44%
iPods	8	32%
Wikis	7	28%
Mobile phones	4	16%
Other	4	16%
SMS Texting	2	8%

Future developments. Financial support for future e-learning development came from a variety of sources, such as local university-funded initiatives and HEFCE funds via Centres of Excellence in Teaching and Learning (CETLs). This funding supported individual one-off projects. e-Learning had no protected funds that would have allowed the development of sustainable programmes developed year-on-year. This form of *ad hoc* funding was the most common method of support, outlined by 17 respondents (68%).

The way in which academic staff support and development for e-learning was provided was inconsistent, though local learning technology support units (LTSU) were the main source of support. This seemed to be centred on academic development in the use of e-learning applications to support teaching and learning (11 respondents, 44%). Development also concentrated on preparing staff to create new courses (ten respondents, 40%) and had a focus around enabling staff to add content and maintain existing courses (11 respondents, 44%).

In contrast, student training in the use of e-learning applications was mostly funded centrally. It was often provided by central IT units. These central service units were the main source of support in 13 (52%) of the respondent HEIs. Students who were identified as having disabilities and special needs received more focused and specialised support and training in 14 (56%) institutions. This suggests that universities often managed student training at an institutional level, ensuring consistency in student experience, rather than leaving local faculties or departments to develop their own provision.

Phase 2

Themes identified from the analysis of qualitative data included ‘enablers of use’ and ‘barriers to use’ with sub-themes as in Table 5.

Enablers of use. There were four sub-themes identified from the data that were thought to support the use of e-learning: institutional strategies, demand, staff champions and technical support.

Institutional strategies. All of the case study sites had an e-learning strategy. Some universities incorporated e-learning into the teaching and learning strategies by including statements about provision and aims. In other HEIs the e-learning strategy had been formulated as a separate document. The strategies were aligned to corporate plans and reflected an idea of permanency. Various development opportunities and resources were in place to support the achievement of strategic aims, as reported by one participant below:

‘They put out for secondment for a certain number of days depending on how big, if you like.’
Site 20

Table 5. Themes and sub-themes

Enablers of use	Barriers to use
- institutional strategies	- lack of IT skills (academic and student)
- demand	- resourcing
- staff champions	- reluctance to use (academic and student)
- technical support	

Two of the institutions drew on CETLs located within the institutions. Secondments into the CETLs bought the staff time to develop e-learning materials. This approach supported the development of individual staff skills. It was hoped that secondees would cascade their learning to members of their school and department on their return. The quote below discussed CETL funding use:

'The facilities we have got here though mainly funded through the CETL funding, the school also supported us using these facilities and converting all the rooms to become a sort of dedicated e-learning unit.' Site 11

Demand. Staff at two case study sites particularly felt the students were drivers for the development of e-learning and use. They believed students expected to use computer-based learning, having had exposure to this in secondary schools. The provision of e-learning within a curriculum was therefore viewed as necessary and also a possible factor that might attract prospective applicants, as suggested by a participant from Site 15:

'The market, the student, if you don't have an all singing and dancing platform then the students will not come.' Site 15

Staff champions. Staff were seen to have the potential to drive e-learning and teaching developments. Those particularly keen on developing and trying new technologies to support learning were viewed as 'champions' by technologists and staff. They held an important role in experimenting with new technologies and in driving central IT services to increase technological availability, as seen in the quotes below:

'We do have a few enthusiasts who are using it [IT] in more sophisticated ways.' Site 4

'He's [referring to a local e-learning champion] enhancing the student learning experience and trying to ease the administration and efficiency for teachers.' Site 23

Technical support. The technologists felt that providing local support was more helpful to the adoption of e-learning and teaching than having centrally located services, and staff agreed with this, as seen in the quote from Site 19:

'I think [name removed] provides excellent support.' Site 19

Overall, technological support was seen as vital to enabling e-learning and teaching development and delivery. It was felt that without such input the development of e-learning and teaching would be left solely to enthusiasts, as the majority of staff would not have the skills to embrace new technologies. It was also suggested that many users would be reluctant to engage if technological support were not readily available; one participant stated:

'The staff need support to help them, which is understandable.' Site 22

Barriers to use. The respondents identified three main barriers to the use of e-learning: issues with lack of IT skills, resourcing and a lack of stakeholder demand.

Lack of IT skills (academic and student). The staff interviewed reported that poor student IT skills provided a barrier to use that they had to try to overcome. There was a general impression that this related to the more mature student in particular, as suggested by a participant from Site 5:

‘There’s a wide range really, a lot of them are quite mature so I think less of them are technically literate.’ Site 5

The staff also identified limitations in staff IT skills and suggested staff did not have the necessary knowledge and skills to develop interactive learning materials for students. One respondent commented that:

‘...the difficulty there is finding someone to write it in an interactive way, because we haven’t got the skills to write it so they have online activities.’ Site 4

Resourcing. A number of issues with resource availability emerged. There was a lack of computer facilities available for staff and students in clinical environments, and those available were heavily used by a range of clinical staff. While other computers were provided in clinical settings, for example in study centres or libraries, these were difficult to access as leaving the clinical setting was problematic. There were also issues with poor password provision in practice settings. Either students were not provided with them or use was restricted. One participant from Site 3 commented on these access difficulties:

‘One of the discussion board complaints that goes on, is I haven’t got a computer, I haven’t got access to the Internet [at work].’ Site 3

Staff in some sites also suggested that they lacked time to support the development of e-learning resources. Staff added development time onto their existing workloads, which was problematic, with one member of staff reporting:

‘I think the restrictions are [our] time.’ Site 4

There were opportunities for staff to apply for financial assistance to support e-learning developments, but a small staff base meant buy-out was also problematic.

Reluctance to use (academic and student). It is clear that a number of staff were reluctant to use e-learning, with a participant from Site 15 commenting that:

‘There remain some lecturers, as I say who would not touch it [e-learning] with a barge pole.’ Site 15

Obviously some staff preferred to leave e-learning and teaching development and use to others, not wanting to engage with new technologies to support their teaching.

Discussion

Overall our findings suggested that e-learning remains at the periphery of educational delivery in nursing and health sciences. It is utilised predominantly to support face-to-face teaching and provide student information. The development of online management systems has concentrated on managing student recruitment and progress, and tracking attendance.

All institutions provided wide student access to learning resources such as library databases, many through a portal system that operated with a single user name and password.

Engagement with e-learning was predominantly at an instructivist level (Peters, 2000), an approach that is teacher-centred, where the learner takes a more passive role, accessing knowledge provided by the teacher, rather than seeking to generate knowledge and understanding. Virtual learning environments, for example, were used by 96% of respondents as a mechanism for providing course information and learning materials. A smaller percentage (84%) were using VLE discussion boards to provide a communication forum as part of a blended learning approach. This suggested VLE use has remained fairly consistent over the last seven years, being predominantly a repository for information (Crook and Barrowcliff, 2001), and institutions have not developed the use of the interactive functions to any great extent. Other e-learning media such as DVDs, CD-ROMs and online videos were also used as a means of information provision.

The use of Web 2.0 interactive technologies was still in development. Those tools most used included blogs (online logs) and wikis (web-based documents that can be created and edited online as part of a collaborative process). Mobile technologies were the least developed and used, often being employed to text student information or as an additional method of communication of short messages, as found in previous research with nursing students (Young *et al.*, 2010). Institutions often relied on local staff 'champions' to undertake this kind of technological experimentation and development. These 'champions' were self-motivated individuals with a passion for technology and a range of skills and expertise, generally self-developed, to draw on. They influenced wider institutional adoption of new technologies through working to support local staff development and organisational adoption of technology. The availability of specialist technological staff was also important to development, as many lecturers felt ill-equipped to undertake e-learning developments without support.

There was also recognition that student demand for technology in the programmes was an important influencing factor. Staff felt the drivers for e-learning and teaching development were coming from students and from the desire to deliver quality education to part-time students and those off campus, including those based internationally. In these institutions a combination of student expectation and 'champion' leadership was driving the development.

Development was also affected by resource availability, an issue also identified in a scoping study of the use of e-learning in social sciences (Marsh *et al.*, 2008). A number of institutions took a project approach to e-learning inception, requiring staff applications for development time and monies. This limited the degree of development and affected sustainability and wide dissemination, as projects were time-limited.

Those institutions with CETLs that had a clear focus in e-learning development and use (Young and Menon, 2008) were able to overcome some of the development problems, though still tending to take a project approach to inception. The existence of the CETLs often reflected the institutional teaching and learning strategies that were linked to corporate plans to excel in e-modes of delivery. These institutions benefited from the combination of e-learning expertise, availability of technological resources and facilities, and were able to take advantage of secondment opportunities offered by CETLs to aid staff in the development of e-resources.

Traditionally some groups of health and social care professionals have been reluctant to engage in IT use (Wishart and Ward, 2002), with issues of lack of confidence in use and limited IT skills (Boyle and Wambach, 2001) seen as contributing to this position.

Indeed our findings suggested that these factors remained a barrier to use for a proportion of staff. This resonates with previous work that suggested fewer than half of nurse educators felt they had the necessary IT skills for their job (Ragneskog and Gerdner, 2006).

The long-held difficulties of computer provision in the clinical environment also posed difficulties for the development of e-learning. Despite the advent of the National Health Service (NHS) Connecting for Health agenda (NHS, 2006), which seeks to increase the use of computers to support patient care and learning in the NHS, there remains a lack of computing facilities in many areas. Where computers and internet access were available, the need for passwords and competing priorities for use prevented student access for learning (Gerrish *et al.*, 2006; Gilchrist and Ward, 2006; Ward and Moule, 2006). These resourcing issues limited the scope of e-learning and teaching use in practice settings supporting undergraduate students and staff completing continuing professional development courses.

In respect of future developments, there was a particular desire to allow student access to online personal development planning (PDP) tools and e-portfolios. Currently, nurses are not required to use a specific e-based portfolio to record learning, though this exists among a limited number of health care professional groups (Haig *et al.*, 2007). The wider development of e-portfolios would have particular relevance for nurses who are required to evidence their practice learning and demonstrate achievement of core competencies. Wider availability of e-portfolios would enable online access to geographically disparate parties, allowing mentors, students and university staff to monitor and comment on the assessment more readily (Gomez and Lush, 2006; Gulati, 2006). Additionally, e-based portfolios can be used to submit a wide range of evidence to support outcome achievement, such as electronic links, photographs and video.

The results of this study highlight key issues for the future development and research of e-learning and teaching in nursing and health science programmes. It is clear that the current funding approach to development is *ad hoc* and time-limited. This approach has affected the sustainability and scope of developments. Funding issues are likely to be compounded in the current economic climate and it is therefore important to identify ways of maximising the impact of any investment. For example, addressing Intellectual Property Rights issues may aid wider collaborations and dissemination of developments across the sector. Currently, ownership issues affect the sharing of many developments and this leads to duplication of effort and unnecessary resource expenditure.

It was also apparent that development is linked to the availability of e-technologists and local 'champions' who are often fitting experimentation and development into existing role requirements. Maximum benefit was gained from these individuals when sited within a recognised Centre of Excellence with funding support. While the scope and financial capability to broaden the existence of CETLs are lacking, it is important that the Higher Education Academy Subject Centres ensure learning from CETLs is captured through research and evaluation and that good practice examples are shared widely across other HEIs.

One example currently quoted was the provision of sabbaticals within the CETLs, used to develop resources and staff skills, which were then disseminated back within the wider school or department. This approach helped to develop skills and challenge some of the trepidation related to working with new technologies in teaching and learning.

There were some limitations to the study that should be acknowledged. Although a comprehensive survey of all universities running relevant courses was not achieved, this research did engage with institutions from various geographical locations and included responses from a range of universities that majored in both research and teaching and learning.

Additionally, the semi-structured interviews concentrated on asking broader questions about the institutional use of e-learning and teaching, and failed to ascertain key individual characteristics that might have been of importance to the analysis. For example, the age and experience of the interviewees may have affected their views on e-learning and teaching.

Conclusions

In conclusion, this study has indicated that e-learning is used predominantly to allow student access to information and to support existing face-to-face teaching and learning, and remains a peripheral part of the educational provision in many organisations. Where there are pockets of wider development and experimentation, these reflect the existence of key centres of excellence and the efforts of ‘champions’ supported through small project funds. If the policy drivers to see enhanced use of e-learning are to be realised, then it is clear that a more systematic approach to development and funding is required. Those institutions with CETLs focusing on e-learning were able to capitalise on the strategic local drivers and expert provision within the CETLs. The CETLs provided a focus for staff development, technical support and key funding opportunities. While these focused CETLs will remain limited in number, the associated learning identified can have a wider impact through the sector. Through identifying strategic direction and drawing together key resourcing and support, many of the issues currently impacting on development and use may be reduced and e-learning and teaching use optimised.

Key points

- e-Learning is being used to support student learning, though mainly in an instructivist way.
- e-Learning environments are also supporting student recruitment, progress and tracking attendance.
- There is evidence of some further development and use of e-technologies, though these are linked to the availability of technological specialists and ‘champions’.
- Project developments require technological support and often rely on project-type funding that adversely affects sustainability.

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Pam Moule EdD MSc BSc (Hons) Dip N Dip NE RNT RN is Reader in Nursing and Learning Technologies and Director of the Centre for Learning and Workforce Research in Health and Social Care at the University of the West of England, Bristol. Pam's research interests include e-learning, resuscitation and practice development and evaluation. She has a number of publications in these fields and in nursing research. Email: Pam.Moule@uwe.ac.uk.

Rod Ward MA Ed BSc (Hons) MBCS RNT RN is a senior lecturer in the Faculty of Health and Life Sciences at the University of the West of England, Bristol. He has a background in Accident and Emergency Nursing and now teaches and carries out research in the fields of health informatics and e-learning. Email: rod.ward@uwe.ac.uk

Lesley Lockyer PhD MSc BSc (Hons) Dip N RN is the Director of Market Intelligence, a lecturer and researcher at the University of the West of England and has contributed to a number of research projects based at the Centre for Learning and Workforce Research. Lesley's other research interests and publications include aspects of women's experience of coronary heart disease and the sociology of long-term conditions. Email: Lesley.Lockyer@uwe.ac.uk

Appendix I Sample staff interview questions

Could you give us some examples of e-learning use in the curriculum?

Could you tell us which e-technologies are used to support Nursing and Health care curriculum?

Can you tell us about any barriers to e-learning implementation? How might these be overcome?

Can you tell us about any advantages of using e-learning?

How did your faculty/school/department prepare itself for e-learning development and use?

Is there an e-learning policy/strategy in place? How is this implemented?

How does the university fund its use of technology in learning?