Investigating staff perceptions of e-learning development and support for students with disabilities in higher education

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Abstract

This paper reports on a study concerned with exploring staff perceptions on improving the design and delivery of e-learning provision for students and staff with disabilities in a higher education institution in the Republic of Ireland. The study aims to clarify understanding on how aspects of e-learning affect some of the key stakeholders in an institution of higher education – a disability liaison team, a learning technology team and an academic development centre. Essentially this paper is an example of research for learners with disabilities by people without disabilities. The language used in this paper is consistent with the social model of disability.

The objective of the research is to improve the design and delivery of the e-learning curriculum with a view to enabling the potential of e-learning work towards inclusivity for the institution's students and staff with physical and learning disabilities. The specific context in which this takes place is in the area of academic development, which is charged with assisting in the provision of e-learning support to academic staff who in turn facilitate the learning of students with disabilities.

The research consisted of a qualitative study conducted with the collaboration of academic colleagues in the institution. The data were collected from an audio-taped focus group interview. The main findings show that initial collaborations need to be consolidated between the key stakeholders of Disability Services, Learning Technology Team and Academic Development to ensure that further training and piloting of online learning materials take place in order to support staff and students with disabilities in participating in e-learning courses and initiatives across the institution.

The study concludes with a series of recommendations including a possible framework devised by participants in order that the e-learning approach be adopted into the training and development initiatives taking place each academic year in the institution. An evaluation strategy is also proposed to measure any impact of the changes to practice.

Keywords

Dyslexia, e-learning, information technology, learning disabilities, virtual learning environment, visually impairment, World Wide Web

Introduction

The issue of accessibility of e-learning formats for individuals with various disabilities is an important one as use of online courses and programmes continues to increase in higher education. The gains students with disabilities have made in accessing post-secondary opportunities must not be slowed by the growing use of technology-mediated instruction, both for distributed education on campus and distance education at remote sites. This paper considers an important area of working practice within academic development in higher education, the inclusion of all students and staff with disabilities within the context of e-learning development and support. The context for this study is within a higher education institution in the Republic of Ireland.

At one time, technology was considered marginal to learning and teaching practice in higher education, now however, most institutions talk about e-learning, which ranges from utilising an online learning environment (OLE) for providing online course information to blended learning where technology is used to support face-to-face teaching, to distance learning where entire courses are online. Indeed, it has been argued that any consideration of the growing role of academic development in higher education, in which this study is situated, has to be set against the continuously dynamic state of technological development (Land 2004).

There is a growing use of information and communication technologies (ICTs) in education settings to provide quality learning and assessment in education and training. Many of these systems provide substantial challenges to those with disabilities beyond the more everyday difficulties of using and coping with new technology. Professional associations, awarding bodies, educational institutions, training providers and employers are all responding to the challenges of the new e-learning tools, the demands and expectations of the individuals with disabilities and the implications of new legislation. Furthermore, to some, making curricula content accessible for all students is a complex

issue but in fact the most often used medium for teaching and learning – that of printed textbooks – could be considered the most inaccessible.

How best to promote student learning during online instruction is a priority everywhere. Tim Berners-Lee, W3C Director and inventor of the World Wide Web (WWW) has said 'The power of the Web is in its universality. Access by everyone regardless of disability is an essential aspect'. (http: //www.w3.org/WAI, Paragraph 1). This is especially important when seeking to accommodate the unique learning needs of individuals with disabilities (Brown 2002). Far too little emphasis has been focused on helping *all* learners interact with the new technologies and the information sources to which they offer access (Djoudi and Harouos 2001). This study aims to address the lack of emphasis on this aspect of inclusion.

Research aim

The main aim of this research was to explore how to make the potential of e-learning work towards inclusivity for students and staff in the institution with physical and learning disabilities. The specific context is in providing support to academic staff in facilitating the learning of students and staff with disabilities. It is vital to reduce their exclusion from the culture, curricula and communities of e-learning that have been developing in this institution over the past few years, and indeed within all higher education in this new millenium of learning.

Scope of e-learning in higher education

During the last two decades, ICTs have been developing at an unprecedented and increasingly rapid pace. The use of the Internet, the WWW and increasingly, virtual learning environments (VLEs) has revolutionised communications and is causing radical developments in the ways universities and colleges enable their staff and students to find and create knowledge and interact with each other (Land and Bayne 2004). The growth of the higher education sector in Ireland during the period of rapid expansion in the 1980s

and 1990s came about in a climate where demand for places far outstripped the capacity of the system to provide them. A side effect of the *laissez-faire* approach has been the absence until a few years ago (January 2003) at national level of any strategic planning or strategic enabling initiatives in the field of e-learning for teaching and learning. Individual institutions have responded in a strategic manner to a greater or lesser extent. Experimentation with web-based support platforms is universal, although in a majority of cases it is targeted at campus-based students as a 'value-added' support. VLE platforms are used to manage the learning environment, (e.g., to provide essential course materials [largely text-based or PowerPoint presentations]), bulletin board facilities and a modicum of class discussion opportunities. Staff and students must have convenient and reliable access to a robust ICT infrastructure, preferably supporting broadband, nationally and locally. Ireland fares reasonably well at this time, at least at the level between the major university and polytechnic campuses. However, a survey conducted by the Union of Students in Ireland (2003) highlights the difficulties often experienced by students seeking to access basic computing facilities in the crowded computer laboratories and libraries of their respective institutions. And while many students and academic staff now enjoy remote access to campus networks, access from home still tends to be at low access speeds.

A strategic review carried out by Skilbeck (2001) identifies the major challenges facing the university sector in Ireland, which by extension may also be applied to the institutes of technology. Among these he includes: 'a progressive shift from formal, institution bound teaching to technology facilitated learning' (p. 25). He goes on to assert that: 'Unless the established, public sector institutions are able to achieve greater openness and flexibility they will be challenged by a variety of alternatives … including for-profit private universities taking advantage of … the technology driven "virtual universities"' (p. 76).

Skilbeck's views, which have been influential in shaping strategic debate, are highly cautionary in relation to the university led initiatives in deploying ICT for teaching and learning. He recognises 'new opportunities for creative and innovative teaching and

new relationships both with students and the shifting world of knowledge' (Skilbeck 2001: 89). Since then, published strategic plans of all major higher education institutions address learning technologies and e-learning. Strategic planning for organisational change is already taking place at the national level within the university and polytechnic sectors and e-learning is recognised as an important element in a changing educational landscape. However, Skilbeck then asks 'Are staff motivated and adequately prepared to take advantage of the opportunities?' (p. 89). Thus, one point on which there has been unanimous agreement is the need for improved staff academic development opportunities focused on the academic as teacher, facilitator and mentor.

The organisational culture within the institution in which this study is located both encourages and supports academic developers and inquirers into what is presently required to support academic staff and how to do it better in the future. There is movement towards educators being empowered to participate authentically in pedagogical matters of fundamental importance within the institution – what the institution is for and how learning and teaching can be aligned with this vision. A Strategic Plan for the institution for 2001–2015 has been developed and provides the Institute with a number of strategic themes each underpinned by specific strategic objectives and goals; these emanate from the institution's response to the OECD Review of Higher Education in Ireland. Institutionally, support for this initiative is present.

> socially inclusive equality of access must also be a high priority for social and equity reasons but is also as an economic imperative if the personnel needs of a higher skilled economy are to be met. Benchmarks for socially inclusive access and disabled student enrolment should be set out in the Policy Framework.
>
> …more flexible delivery modes, web-based e-learning course delivery mechanisms, and support and guidance for students accessing information through the web.
>
> (OECD 2004: 4)

Students with disabilities in higher education in Ireland

Numbers in higher education in Ireland have grown from 18,500 in 1965 to more than 200,000 in recent years. The late 1990s and the early 2000s saw a marked increase in the number of students with disabilities participating in Irish higher education. The most recent figures available through the Higher Education Authority indicate that in the academic year 1998–1999 some 850 students with disabilities were studying on undergraduate programmes in Ireland (HEA/AHEAD 2004). This improvement in the participation of students with disabilities in higher education has taken place against the background of a number of developments including the introduction of equality legislation and the provision of targeted funding initiatives, supporting access to higher education by students with disabilities, by the Higher Education Authority.

Funding has been made available to higher education students with special needs and such grants are to cover costs of purchase of special equipment, materials etc. At the same time, there are growing numbers of support systems for students with disabilities who are undertaking courses in higher education in Ireland, including the setting up of the post of Disability Officer in several institutions.

There is room for e-learning to continue to grow to support the growing student population in Ireland. There is evidence to indicate that in 2010 the likely total admissions of students in higher education in Ireland will be 41,867 and 47,237 in 2015. In relation to under-represented socio-economic groupings (including students with a disability) a steady number of 50 additional admissions is applied up to 2008, growing to 75 additional students from 2009 to 2013 and to 100 additional students in subsequent years (HEA 2004).

Context: identification of institutional issues

The wider context in which this work was conducted is within the relatively newly established Higher Education Academy (HEA). Part of the web-based mission statement sets the scene for this research:

> The Higher Education Academy is concerned with every aspect of the
> student experience. It will provide coherence, added value, inclusivity and
> a powerful emphasis on the needs of stakeholders.
>
> (Ramsden 2004: Paragraph 1)

Specifically, the author works as one of a team of academic developers in a Learning and Teaching Centre in a Higher Education Institution in the Republic of Ireland, supporting 1,500 full and part-time academic staff, who in turn educate a large number of students (21,414 registered in the academic year 2003–2004).

As the main purpose of this Learning and Teaching Centre is to enhance the quality of the learning experience for *all* students through provision of on-going professional development opportunities for all academic staff at individual, department, school, faculty and institute levels, ultimately, it is hoped that this study will contribute towards making the Centre a learning organisation that is expert at dealing with change as a normal part of its work. It has been argued that moral purpose needs an engine, and that engine is individual, skilled change agents pushing for changes around them, intersecting with other like-minded individuals and groups to form the critical mass necessary to bring about continuous improvements (Fullan 1993).

> Change flourishes in a 'sandwich'. When there is consensus above, and
> pressure below, things happen.
>
> (Fullan 1993: 37)

For such change to continue will require a response to the needs of a diverse and changing student population, and, as a result, its academic staff, a rapidly changing learning technology in the educational environment, and demands for excellence from the workplace. Assisting academic colleagues with new learning technologies at the levels of skills development, electronic courseware and materials development, design and delivery of online programmes and strategic aspects of implementing learning technology

at institutional level, is becoming an important feature in the work of academic development in Ireland.

For the past five years the author has been involved with the implementation and support of e-learning within the institution, and supporting the institution's virtual learning environment of choice, WebCT. The specific role within this is to train and support academic staff in planning and delivering e-learning courses for their students, from a variety of subject disciplines. In the context of this study e-learning means delivery of online learning materials, text-based email (asynchronous), chat systems (synchronous) and computer conferencing (asynchronous). Other possibilities are real-time text-based chat systems, text messaging (SMS) via mobile phones and IP-based videoconferencing, but as these have yet to make a significant impact on formal education, they are not included in this current study.

This institution has been most proactive, over the last few years, in encouraging people with disabilities to choose the institute as their higher education option. Consequently, the institute has seen a steady increase in the numbers of students with disabilities registered with the Disability Support Service. The numbers listed below indicate this increase since the academic year 1998–1999.

Insert Figure 1 here

These numbers include students with a wide range of disabilities, which for the purpose of this study are taken as physical, sensory, medical conditions, mental health difficulties, specific learning disabilities and other neurological conditions. Currently, and surprisingly, the number of staff with disabilities is unknown.

It is significant that the Institute has noted a marked increase in the number of part-time disabled students availing of the service and also an increase in second- and third-year full-time undergraduate students being referred to the service, who have identified with one of the specific learning disabilities such as dyslexia. Judging by these

marked trends numbers can be predicted to further increase over the next few years. The e-learning manager in the institute indicated that there is currently no e-learning provision made for students with dyslexia, and has welcomed this study as an opening investigation.

Rationale

> Disabled people are under-represented in higher education … the UK has
> some way to go before it can boast of equal access for disabled students
> to higher education.
>
> (Skill 1997: 5)

Shevlin *et al.* (2004) state that students with specific learning disabilities form by far the largest group of students with disabilities in higher education. Even though the enactment of various disability laws has contributed to the increasing enrolment of students with disabilities in higher educational institutions in the UK and Ireland, these students constantly face various barriers in their educational environment (Paul 2000: 209).

When disabled people enter higher education they are taking up an opportunity to increase their knowledge, to develop their social skills, to obtain good qualifications and to expose themselves to debate and discussion. It is an important experience for empowerment (Hurst 1996: 141). Fuller *et al.* (2004) concur with this belief that for students with disabilities participation in higher education is a matter of equal opportunities and empowerment. Academic developers and learning technologists need to be at the forefront of developments helping staff to meet the pressures of the legislation, while at the same time identifying ways of better supporting all students.

Support for academic staff in higher education in facilitating the education of students with disabilities comes from a wide variety of sources. There are visiting workshops and consultations available in university settings. There is no doubt that in higher education, support is more readily available now for academic staff supporting students with disabilities. This is slowly spreading to a focus on how technology can

assist in educating students with disabilities. In several areas there is no doubt that this institution has made great progress in facilitating students with a range of disabilities. There is an Assistive Technology Training Room in the institution with a range of computers and specialised software to make information available in different accessible formats for students with disabilities. An Assistive Technology Trainer provides assessment and advice to individual students and also training and on-going technical support in the use of this equipment.

However, as online delivery becomes more widespread across the institution, there is a need, as Booth and Ainscow (1998: 78) state, for all 'communities of neighbourhood centres of learning' to explore what this means for the design and delivery of truly accessible electronic materials and forms of communication. There are various pockets of people working separately in the area of e-learning and supporting students with disabilities in this institution, and this research is beginning to bring these groups together to collaborate in development for the future.

It was important to be cognizant of what existing academic literature was saying about relevant e-learning developments in this area, so a brief critical summary of the literature is provided surrounding the issues of inclusion of students and staff with disabilities and how the provision of e-learning technology can best support this inclusion.

Critical summary of literature

There has been a drive towards inclusive education. From January 2006, a new Disability Equality Partnership in the UK (Action on Access, the Equality Challenge Unit and the HEA) has taken on the responsibility of providing support to higher education institutions in promoting equality of opportunity for students with disabilities. Fraser and Sanders (2006) have described a number of innovations in professional development which have resonance for this study, and which focus on the teaching of students who have a disability. Of particular relevance are changes to the type of communication used by

teachers with students with disabilities such as the mode of presentation, taping of lectures, the use of more diagrams and the development of written notes.

There is now a multitude of web sites available providing current guidelines on web accessibility/usability including, in the Irish context, projects such as the Association for Higher Education Access and Disability (AHEAD, see http://www.aheadweb.org) and the National Disability Authority (http://www.nda.ie) on behalf of the Irish State which promotes and helps secure the rights of people with disabilities. However, there is a paucity of research exploring the potential of e-learning to support inclusion for students and staff with disabilities in higher education, specifically the evolution of e-learning into a learning communications forum for persons with disabilities.

In recent years there has been a growing awareness that some delivery system technologies can be used to transcend some of the learning difficulties experienced by persons with physical handicaps; this realisation fits in well with concern for the needs of so-called 'non-traditional learners'. There has been an outpouring of energy and creativity into ways of using information and communications technologies (ICT) and the information society (IS) to create inclusion, as an opportunity to tackle, reduce and even prevent social exclusion. Virtual learning environments, such as WebCT can provide many of the elements of a classroom but because of its asynchronous nature, computer conferencing or online discussions as they are also known, permit scheduling and timetabling flexibility.

This is not seen as replacing human support systems as it is believed that for any system to be successful it must take human factors into account and adequately prepare new users. In his research with students with hearing impairments using computer-mediated conferencing for learning Coombs (1989) found that they had become somewhat dependent on the human support system and this inhibited them in developing the degree of self-direction demanded by some forms of e-learning.

Furthermore, Coombs (1989) argues that therein lies a dilemma for educators. On the one hand, educators want to tailor e-learning to be of maximum use to persons with physical disabilities. On the other hand, the technology permits genuine mainstreaming because physical appearance becomes insignificant. Online learners are judged by their contributions and not by external indications of status or success. Persons with physical disabilities who are equipped and ready to compete in an educational or social setting may become online learners and be unknown to online educators; their disability may also be invisible to other learners. The more such technologies succeed in meeting these special needs, the less we may be aware of their achievements.

Research by Seymour and Lupton (2004) has produced some very interesting questions regarding people with disabilities using technology. Clearly the Internet represents a huge new step in interpersonal communications by offering people with disabilities the possibility of confronting the issues of time, space, communication and the body. But what happens when people with disabilities engage with the computer? Do they use the Internet to develop friendships and intimate relationships? Does online communication enhance self-identity and social being? Do people use the Internet to transcend the vagaries of their frail and vulnerable bodies? Or are they simply 'holding the line' online, using the Internet as they would use a letter or a telephone? Is the Internet a chimera, a failed promise, for people with disabilities? These key issues were pertinent for the development of the focus group, alongside what Fuller *et al.* (2004) report: barriers to learning occurred in lectures and other teaching situations, whilst there were accessibility problems using learning technology facilities and in problems with staff attitudes.

Primary research

The previous section describes the key developments in e-learning and inclusion of disabled students and staff in higher education, with a particular focus on the context within an institution in the Republic of Ireland. This section is concerned with how these developments were investigated empirically in the context of this study. Both the

epistemological stance and the research aims of this study have shaped the development of the research design and method selected to conduct this research. This section has been divided into two parts: the first will identify an appropriate methodology for use in this study, and the second will give a more specific outline of how this has been applied to the research design.

Yin (1994) believes that case study is the preferred methodology when questions such as 'how' or 'why' are posed; the essence of this method is its enquiry into real-life context. Cohen *et al*. (2000) outline the benefits of case studies in investigating the causes and effects of real situations. The real-life context for this study involves describing, understanding and explaining each of the participants' interpretations and sense-makings of their experience of working with students and academic staff with disabilities. It is important to seek out and present multiple perspectives of activities and issues in this area, 'discovering and portraying the different views' (Stake 1995: 134). This approach is seeking to enhance contextualised understanding for the participants/stakeholders closest to the area within the institution (which are the disability liason officers, the Learning Technology Team and Learning and Teaching Centre tutors). Greene believes that doing so promotes 'values of pluralism as well as forging direct channels to improvement for students with disabilities' (1994: 533).

Cohen *et al*. (2000) furthermore describe the paradigm most suited to case studies as interpretive and subjective. The epistemological stance is significant because the subjects of the research are people who are all individuals and who view the world differently. The research detailed in this study involves six support staff, with a range of prior experience in using learning technology or new pedagogical approaches in their practice to support academic staff and students in the institution; therefore the research method used is 'soft' and predominantly qualitative.

It was important that the method chosen was fit for the purpose and methodology of the study. Gaining a rich, human element indicating how the participants feel about using e-learning technology to support an inclusive education for all at the institution was

paramount. Isolation in research is a problem because it imposes a ceiling effect on inquiry and learning. Solutions can be limited to the experiences of the individual. Fullan (1993) argues that for complex change you need many people working insightfully on the solution committing themselves to concentrated action together. This author profoundly agrees with Fullan (1993: 9) on this and feels it is up to us to 'consume, critique and produce knowledge' about the e-learning and inclusion and 'engage in discourse and action to improve the conditions, activities and outcomes' of the learning environment within the institution.

Therefore this small-scale qualitative study describes the interpretations of six key informants to discover their views on e-learning being used effectively towards inclusion of students and staff with disabilities in the institution. The institution's disability service was invited to participate in the focus group (two disability officers), along with the institute's e-learning manager, two web designers and a member of the academic development team for academic staff. These people were chosen because they included the voices of those working alongside the author. By facilitating a meaningful discussion with these staff, progress can be made towards achieving the study's aim. The following questions guided the focus groups:

- How would these participants feel about this topic?
- What kinds of questions will produce the kind of discussion I desired?
- What should the role of the author as moderator of the discussion do or not do to manage the group dynamics?

The short timeline for this study called for a degree of structure to strike a balance between the researcher's agenda and obtaining the participants' very valuable insights. The focus group interview was audio taped and the guide and questions are contained in Appendix A. Transcription was used to convert the conversations into analysable data.

As a structure for the focus group interview three areas were set for exploration: key concepts, practices and resources related to inclusion of learners with disabilities.

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The data types to be collected included a range of facts, attitudes, opinions and perceptions about using e-learning to complement other relevant technologies in the support of students and staff with disabilities within the institution. Lee and Fielding (1995) state that group discussions have a special value for those who want to assess how several people work out a common view, or – as in this case – a range of views about the same topic.

Focus groups can be an appropriate research vehicle when the goal of the investigation is to gain an understanding of the 'why' behind an attitude or behaviour (Greenbaum 2000: 6). They are a form of evaluation in which groups of people are assembled to discuss potential changes or shared impressions (Rubin and Rubin 1995). There are a number of key elements integral to the technique: the authority of the moderator, the ability to use both verbal and nonverbal inputs as part of the learning process, the group dynamics in the room, the concentrated attention of the participants, the ability of the participants to be directly involved in the research process, controls over security and the dynamic nature of the process.

It was vital to know how best to use e-learning to complement other relevant assistive technologies in the support of students and staff with disabilities within the institution. As an adjunct to this, understanding how any barriers to inclusion and web accessibility have been constructed so that they can be removed was also useful. It was intended to give due consideration to the use of language of inclusion so that there would be a common discourse between the stakeholders. This is the core of the study related to working towards an understanding of how collectively, key institutional personnel could increase participation of learners in the curricula, culture and community of e-learning growing within the institution.

Ethical considerations

There may be a great deal of sensitivity around this issue and the different participants need to be taken into account. An ethics statement was written as a reference at the

various stages of the study, and a copy was given to the participants in the focus group interview. The participants were assured that their opinions would be valued and that they had a say in how e-learning should be made inclusive for all students and staff in the institution. Voluntary informed consent was distributed as the condition in which the participants understood and agreed to their participation without any duress, prior to the research getting underway.

Discussion of problematics

This study is small-scale and limited to the observations of a small number of key staff from one higher education institution in the Republic of Ireland. Widening the study to include several focus group interviews would have allowed for cross-analysis and further understanding of the perspectives of the target groups. This study did not seek participation from students with disabilities; however, this is planned for a follow-up stage of the research as obtaining the students' view is considered important to the continuing investigation.

Data analysis

The study used an inductive approach to analysing the qualitative data to reveal collective beliefs, values and descriptions about using e-learning to complement other relevant technologies in the support of students and staff with disabilities within the institution.

The method of analysis used on the transcript was based on key aspects of the literature to code the data and to assist with interpretations and discussion. Factors/themes were a focus to the extent that they causally influenced implementation, i.e. the practices and beliefs around using e-learning to complement other relevant technologies in the support of students and staff with disabilities within the institution. Five main categories were used to structure the focus group discussion: target group, organisational issues, accessing types of e-learning, content accessibility, and student support.

Recognition was present for the need to be accurate in measuring the responses and logical in interpreting the meaning of those measurements. Member checking was used and the participants were requested to examine the interpretations drawn, featuring their own words. They reviewed the material for accuracy and palatability (Stake 1995). The participants were encouraged to provide alternative language or interpretation and some of that feedback was worthy of inclusion in the final interpretation. The method used is reported so that it is accessible to others, and the results of the study are reported in terms of theoretically meaningful variables (Kirk and Miller 1986).

Discussion of findings

Interpretations were drawn from the analysed focus group data, and a set of findings formed which will help inform the e-learning strategy within the institution with regards to e-learning development and inclusion of students and staff with disabilities. See Figure 2 for a schematic representation.

Insert Figure 2 here

Target group

The main target groups identified in the focus group where different forms of e-learning could support disabilities are: hearing impaired students (benefiting from getting lecture notes online), students with visual impairment, dyslexia, depression illnesses and mobility problems. The potential for effective and innovative learning experiences is immense. According to a TechDis report (2003), e-learning has the promise to enable learners with particular needs to engage in learning on a level playing field. However, it is arguable that this promise will remain unfulfilled until both accessibility and usability issues are resolved, and visually impaired learners will continue to be disadvantaged in terms of cognitive overload and time and energy input, resulting in a poorer learning experience than otherwise.

Within this target group, three main findings emerged. Firstly it was agreed that students with visual impairment and dyslexia should be able to download documents and use read-back software. Whereas many people with vision problems can learn to touch-type, they usually have problems in reading the screen. According to Salmon (2000) electronic screen readers are valuable when long sections of text are onscreen, but are considered useless when there is a diagram. However, spelling and grammar checkers can be very helpful to users with dyslexia.

Secondly, by using a VLE to access course notes, there was consensus that students with depression illnesses and mobility problems may not need to attend face-to-face classes; however, something to bear in mind is the fact that users who cannot freely move their hands and arms find that they cannot use the keyboard at a reasonable speed for communicating online using synchronous systems, even when the stiffness of the keys has been varied to suit (Salmon 2000). Speech recognition software may be better or perhaps semi-intelligent software that enables the selection of whole words after the first few letters have been typed in.

Thirdly it was believed that e-learning can be used to lessen some communication barriers for persons with physical disabilities. For example, appropriate technologies can permit a teacher who is blind to communicate written material with seeing students and facilitate interactions with the hearing impaired without requiring the services of an interpreter. Modems and phone lines can benefit mobility impaired learners also.

Organisational issues

A number of organisational issues emerged:

- Good planning needs to be in place before materials are put on the web, and there is a strong need for documents to be readily downloadable.

- There is still room for improvement across the Institute in increasing awareness amongst staff of the assistive technologies available. To assist with this, a number of training initiatives could be introduced.

  - Firstly special training sessions could be organised for both staff and students in order to support them in learning about key areas. As part of this one suggestion was to introduce lecturers to individuals with disabilities, perhaps at student induction sessions.

  - Secondly one-to-one tutorials could be held on how to use appropriate accessibility software.

- In the area of quality assurance, standards for uploading material to the web need to be set and adhered to.

- Funding needs to be examined, specifically schemes and grants to allow disabled students to purchase software/hardware for home use.

- Adequate facilities are needed on all the institution's campuses with easy access to these facilities for all disabled students/staff.

- From a technical perspective, assistive technology software needs to be compatible with the e-learning technologies, and technical help in the form of a helpdesk type service is needed when staff and students are using software and hardware in the assistive technology rooms.

Accessing types of e-learning

There were many advantages identified to downloading a learning package and working with it interactively. It facilitates working at one's own pace and physically outside of the college where physical access might be an issue; it also allows for self-paced instruction and revision, and for delivery of concise and accessible course content. However, there is an acknowledged downside, as students might be made to feel more isolated than they perhaps already do, and ambiguous instructions and technical problems could be present.

Placing lecture notes and visual aids on the Internet was seen as a useful supplement to lectures. For example, if for some reason a student has to miss class they

will still have access to the lecture notes and visual aids. This also allows students to further explore material in more accessible formats. However, there are technical limitations to software which staff need to be aware of.

Using the Internet as a library of resources provides access to a wide range of materials, both national and international; but for this to be successful, it is seen as important to develop strong links with library services and, in addition, all staff and students need to be skilled at locating, selecting and evaluating information.

Establishing clear online communication links between students and their tutor was regarded as most useful when any student may be shy, or may not be able to attend a class. One of the intriguing benefits of an online discussion is that because of its relative anonymity, many learners feel freer to share personal issues. According to Kassop (2003) many online tutors have observed that the relative 'anonymity' of online discussions helps create a level playing field for women, homosexuals, students with physical disabilities, and members of other potentially marginalised groups, as they can participate in class activities without being stigmatised. In addition, using online discussion boards can facilitate direct instruction and communication between the teacher and the learner, and is therefore not dependent on the traditional support services provided by interpreters, note-takers or special tutors.

Employing the communication features of a VLE to ensure that students receive feedback/support outside class times was a generally acknowledged principle. Ultimately, research makes a case that this may help retain students on the course (Berge and Huang 2004); clearly, however, other factors are involved. Chat rooms are regarded as potentially problematic, but with a few redeeming features. They may be useful for private support of disabled students and, depending on the type of disability, may be practical in offering students with physical difficulties an alternative to trying to get into campus to see their tutors, or their peers on the course.

Online communication links between learners and tutors were seen as providing mutual support in that both can learn much from each other. For example, they can answer each other's problems/queries, students can identify common misunderstandings to be clarified with their tutor, and it may also build confidence among students. All users are on an equal footing, and they can spread awareness and exchange ideas about particular issues, alongside sharing resources/teaching materials. Ideally, they can build up a community of their own and support each other. Helping persons with disabilities to learn course content is one benefit of these communication systems; another is increasing their independence and self-reliance. The potential for increased independence and a fuller participation in the higher education learning community is certainly exciting, but moving towards this inclusion of many more persons needs to take certain factors into account. Independence itself can be intimidating. If more extensive use of computer conferencing with learners with disabilities is to occur, there has to be a support system to nurture and encourage many of them to overcome any resistance. An extension of this debate is how e-learning could affect positively the sense of self confidence of a person with a physical disability. However, a note of caution emerged. The electronic delivery of higher education instruction appears to have both positive and negative consequences even if the situation is evolving rapidly. While the Internet and e-learning technology is said to be the great equaliser, at the same time it can exacerabate inequality through fuelling unrealisable expectations.

Databases of 'frequently asked questions' (FAQs) were identified as useful for clarifying accessibility issues amongst students, and for providing support for students without tutors having to constantly answer the same questions time and time again; it could also be used to raise the issue of disability with non-disabled students.

Virtual seminars, conferences and video/audio conferencing were noted as useful in situations where students are unable to attend a seminar or conference so they do not have to miss out on the experience, or for students with dyslexia so that they do not have to rely solely on text-based communication. However, as identified earlier, this could be problematic because of the scarcity and expense of a broadband connection from home. It

was felt that it may be better to concentrate on 'simple' technology so as not to overburden students and tutors.

General access issues

Within the institution currently, the assistive technology officers are not based near the assistive technology rooms. In certain areas there are still poor connection speeds, software availability and training. Physical classroom space and sound availability and quality were distinguished as important; however currently there are limited funds to make improvements where needed. Understanding was acknowledged as an important issue; specifically lecturers must understand the particular needs of disabled students and be willing to react accordingly, utilising the facilities made available to them.

There was concurrence that e-learning does provide the means for creating online communities and these can take many forms and are not limited by geography or time. There certainly can be communities of shared interest or characteristics (Wenger *et al.* 2003). However, a key factor in e-learning provision within this and many other higher education institutions is its potential to overcome many of the barriers that students face in accessing learning opportunities, in particular those of place, pace and time. This potential will not be realised simply by access alone. It requires many different and inter-related actions to be taken. In particular, it needs structures in place to support and encourage participation. So although technology can assist students with mobility problems overcoming the physical barriers to participating in learning, it is not a solution to all problems. That need for support and improvements in course design that will tailor the learning content to the particular environment is vital.

Content accessibility

In this institution there are brief guidelines currently available on how to make a web site accessible, but these are just the first steps in making all electronically delivered materials in the institute accessible to all end users. They are merely an introduction to some of the

issues that should be considered when designing for accessibility and inclusion. This current study aimed to capitalise on these and move further towards ensuring that staff web pages achieve a good standard of accessibility for inclusion of all students using e-learning as part of their higher education. It is widely recognised that quality of learner support is an important determinant of learner success and is likely to impact on issues such as widening access, accessibility, recruitment and retention (Bernath and Szucs 2004). It is widely accepted that the current availability of high quality online learning materials is very limited (Clarke 2002). Improved web-site design efforts within the institution could be of benefit to persons who must function with the following constraints: who may not be able to see, hear, move, or be able to process some types of information easily at all or who may not have or be able to use a keyboard or mouse, or who may have difficulty reading or comprehending text.

To achieve improvement in online learning materials, a number of areas have been recognised. More e-learning training is needed, however, even before this is in place, staff need to want to change their teaching methods to using ICT technologies. The guidelines available in the institute at present have been recognised as vague. It was agreed that the accessibility guidelines themselves should be available on the web, as well as links to other relevant resources regarding disability, and design. Any new materials developed need to be piloted with a cross-section of students, and alongside this there is a need to peer review material to ensure it is clear and concise. It was felt that current online course notes do not contain enough graphics, simulations, resources, links, or glossary links. If better use was made of these, then using online notes could allow all students to reflect first and then find their 'voice' in this new medium.

It was accepted that students and staff have differing levels of expertise when using learning technologies and this is also true when considering the use of assistive technologies with learning materials. It has been argued by McNaught (2004) that the widening participation agenda results in a broader cohort of learners whose skill sets, circumstances and levels of motivation may be different from the traditional student. These students may respond better to interactive materials and multimedia than more

didactic approaches. He goes on to suggest that the accessibility agenda has highlighted the difficulties certain groups of learners may have with traditional materials. Many students with dyslexia experience difficulties related to the processing of written language information. These problems are sometimes compounded by short-term memory difficulties, a lack of organisational skills and time management issues which all impact on learning within an online system. The clear presentation of materials is vital, with good navigational assistance and a variety of multimedia options to tap into both visual and auditory skills and support developing coping strategies; but if possible, they must not be seen to be changing the learning outcomes.

Student support

Several steps can be put in place in the short term across the Institute which will better support students with visual impairments and physical disabilities. Firstly all materials need to be tried and tested using screen reading software, and awareness needs to be raised that there are some features of WebCT assessment tools which are quite inaccessible to screen readers. (Information on this was indicated as being available on http://www.webct.com/ask_drc/viewpage?name=ask_drc_ce.)

As the Disability Support Unit is seen as essential, and there is no doubt that such personal support is vital to all who participate in e-learning, it was advanced that this support needs to be provided before and during all stages of the learning process and in many different ways. A future area of growth for lecturers with disabilities is the opportunity to be an online tutor. Online tutoring can be defined as teaching, support, management and assessment of individuals or groups on programmes of learning where there is significant use of network technologies such as the World Wide Web, email and conferencing (Higgison 2000).

Conclusions: personal and professional reflections

The findings of this study have implications for development of inclusive education in higher education. Future implications for myself, my colleagues, the course, the institution and the wider higher education community are explored here through a series of personal and professional reflections.

The main aim of this research was to explore how to make the potential of e-learning work towards inclusivity for students and staff in the institution with physical and learning disabilities. The specific context is in providing support to academic staff in facilitating the learning of students and staff with disabilities. It is vital to reduce their exclusion from the culture, curricula and communities of e-learning that have been developing in this institution over the past few years, and indeed within all higher education in this new millenium of learning. Computer conferencing does seems to hold special potential for communication and education for persons with physical disabilities whether that be hearing, seeing or mobility. The underlying challenge of how to make computer conferencing useful to persons with physical disabilities actually springs from its innermost strength and potential. In an online discussion, participants function on an unusually equal footing. The very anonymity, mentioned earlier, allows persons with physical disabilities to go unnoticed. Once having learned the basic technologies, learners with physical disabilities can participate equally with their disability being invisible.

The research findings show that whilst there are pockets of very useful support established in the institution in the form of Disability Services, the Assistive Technology Room, and the Learning Technology Team, there is room for more cohesion and collaboration. As teachers with a moral purpose will always be key players in any progress made in educational reform (Fullan 1999), further training and piloting of online materials needs to take place.

E-learning appears to be growing rapidly in higher education. There can be few colleges or universities in the UK, Ireland and further afield without some form of online teaching, as most if not all the UK universities are utilising technology to develop what they consider to be e-learning (O'Neill *et al.* 2004). While there has been considerable

interest and investment in the development of online learning materials by the funding councils and individual institutions, the issues surrounding support for e-learning are less well understood and higher education is bounded by a number of assumptions which must now be scrutinised in the light of the learning opportunities offered by technology (Wiles and Core 2004). Current understanding of how to extend this support for inclusion of disabled students and staff is even more opaque. In a traditional face-to-face institution, support for e-learners can be provided exclusively on-campus, but this negates some of the benefits of putting teaching materials online and is increasingly unlikely in the face of initiatives to widen access for learners with disabilities and therein to encourage lifelong learning patterns. This study was one mechanism to ensure that the issues surrounding support for disabled students and staff participating in e-learning are better understood.

The significance of the findings in the research context are that improved development of and access to effective e-learning resources is an issue that all academic developers and, indeed, educators – especially those focused on the learning needs and resources of individuals with disabilities – should address. An increasing array of support resources for such priorities should continue to emerge.

Higher education in Ireland is entering a period of transformation. Participation rates are high and the profile and demands of the student body are rapidly diversifying. In attempting to frame a strategic response, universities and polytechnics recognise that e-learning is a key enabler of change. The status of knowledge and experience of ICT deployment compares favourably with the most highly developed nations. What has been achieved to date is largely the result of the efforts of higher education institutions acting independently. To take the next step will require strategic collaboration, the models for which are currently embryonic and ill-defined. The transformative role of e-learning for teaching and learning in higher education is recognised, but the strategic impact has yet to be realised for all students.

There is little doubt that the development of new forms of e-learning environments and the effective use of new e-learning tools and facilities require us to consider a variety of distinct research challenges; the theme of inclusion and accessibility is one such challenge. It has been argued in a ECRC report (2004) that the UK leads the widespread use of IT in mainstream and special education. It has been very challenging to move beyond research prototypes which encompass well-designed and accessible IT tools and resources, to widespread evaluation and deployment in classrooms or other learning contexts. This study recognises this and is but one currently addressing how we ensure that e-learning facilities are available to all, and that the facilities they provide reflect the diversity of learners. This study further acknowledges that if information technology and e-learning are to have a widespread educational impact then research questions around inclusion and accessibility need to continue to be addressed.

References

Berge, Z. and Huang, Y. (2004) 'A model for sustainable student retention: a holistic perspective on the student dropout problem with special attention to e-learning', *DEOSNEWS*, 13 (5). Available online at http://www.ed.psu.edu/acsde/deos/deosnews/deosnews13_5.pdf (accessed 10 June 2007).

Bernath, U. and Szucs, A. (eds) (2004) ,Supporting the learner in distance education and e-learning', *Proceedings of the Third EDEN Research Workshop*, University of Oldenberg. Available online at http://www.uni-oldenberg.de/zef/cde/eden.pdf (accessed 21 July 2005).

Booth, T. and Ainscow, M. (eds) (1998) *From Them to Us: An International Study of Inclusion in Education*, London: Routledge.

Brown, J.M. (2002) 'Enhancing online learning for individuals with disabilities', *New Directions for Teaching and Learning*, 91: 61–68.

Cohen, L., Manion, L. and Morrison, K. (2000) *Research Methods in Education*, 5th edn, London: RoutledgeFalmer.

Clarke, A. (2002) *Online Learning and Social Exclusion*, Leicester: National Institute of Adult Continuing Education.

Coombs, A. (1989) 'Applications of CMC in education', in Mason, R. and Kaye, A. (eds) *Mindweave: Communication, Computers and Distance Education*, Oxford: Pergamon Press.

Djoudi, M. and Harous, S. (2001) 'Simplifying the learning process over the Internet', *T.H.E. Journal*, November. Available online at http://thejournal.com/articles/15689_4 (accessed 11 June 2007).

ECRC (2004) *An E-Learning Research Agenda Report*, available online at http://www.epsrc.ac.uk/CMSWeb/Downloads/Other/E-learningResearchAgenda.doc (accessed 22 July 2005).

Fraser, K. and Sanders, E. (2006) 'Training the teachers. Participation and access for students with a disability', *Academic Exchange*, 3: 22–23.

Fullan, M. (1993) *Change Forces. Probing the Depths of Educational Reform*, London: Falmer Press.

Fullan, M. (1999) *Change Forces. The Sequel*, London: Falmer Press.

Fuller, M., Healey, M., Bradley, A. and Hall, T. (2004) 'Barriers to learning: a systematic study of the experience of disabled students in one university', *Studies in Higher Education*, 29 (3): 303–318.

Gilbert, N. (ed.) (1993) *Researching Social Life*, London: Sage Publications.

Greenbaum, T. (2000) *Moderating Focus Groups: A Practical Guide for Group Facilitation*, Thousand Oaks, CA: Sage Publications.

Greene, J. (1994) 'Qualitative program evaluation: practice and promise', in Denzin, N.K. and Lincoln, Y.S. (eds), *Handbook of Qualitative Research*, London: Sage Publications.

HEA/AHEAD (2004) *Survey on Participation Rates of and Provision for students with Disabilities in Higher Education for the Academic Year 1998/99*, Dublin: Higher Education Authority.

HEA (2004) *Response to OECD Report*. Appendix 4: Student Population Projections 2003–2015, Dublin: Higher Education Authority.

Higgison, C. (ed.) (2000) *Online Tutoring E-book*, available online at http://otis.scotcit.ac.uk/onlinebook/ (accessed 22 July 2005).

Hurst, R. (1996) 'Disability and policy –survival of the fittest', Paper presented at the Dialogues in Disability Theory and Policy Seminar, City University, London; available online at http://www.leeds.ac.uk/disability-studies/archiveuk/Hurst/disability%20and%20Policy.pdf (accessed 11 June 2007).

Kassop, M. (2003) 'Ten ways online education matches, or surpasses, face-to-face learning', *The Technology Source*, available online at http://www.distance.wsu.edu/facultyresources/savedfromweb/10ways.htm (Accessed 22 July 2005).

Kirk, J. and Miller, M. (1986) *Reliability and Validity in Qualitative Research*, Thousand Oaks, CA: Sage Publications.

Land, R. (2004) *Educational Development: Discourse, Identity and Practice*, Maidenhead: Society for Research into Higher Education and Open University Press.

Land, R. and Bayne, S. (eds) (2004) *Education in Cyberspace*, London: RoutledgeFalmer.

Lee, R.M. and Fielding, N.G. (1995) 'Users' experiences of qualitative data analysis software' in U. Kelle (ed.) *Computer-Aided Qualitative Data Analysis: Theory, Methods and Practice,* London: Sage.

McNaught, A. (2004) 'Simple multimedia using Office software', available online at http://www.skillsforaccess.org.uk/articles.php?id=148 (accessed 6 July 2005).

OECD (2004) *Review of National Policies for Education: Review of Higher Education in Ireland*, Examiners' Report, Paris: OECD.

O'Neill, K., Singh, G. and O'Donoghue, J. (2004) 'Implementing elearning programmes for higher education: a review of the literature', *Journal of Information Technology Education*, 3; available online at http://jite.org/documents/Vol3/v3p313-323-131.pdf (accessed 12 June 2007).

Paul, S. (2000) 'Students with disabilities in higher education: a review of the literature', *College Student Journal*, 34: 200–210.

Ramsden, P. (2004) 'Higher Education Academy', *Exchange*, 6 (7).

Rubin, H. and Rubin, I. (1995) *Qualitative Interviewing: The Art of Hearing Data*, London: Sage Publications.

Salmon, G. (2000) *E-moderating: The Key to Teaching and Learning Online*, London: Kogan Page.

Seymour, W. and Lupton, D. (2004) 'Holding the line online: exploring wired relationships for people with disabilities', *Disability and Society*, 19 (4): 291–305.

Shevlin, M., Kenny, M. and McNeela, E. (2004) 'Participation in higher education for students with disabilities: an Irish perspective', *Disability and Society*, 19 (1): 15–30.

Skilbeck, M. (2001) *The University Challenged – A Review of International Trends and Issues with Particular Reference to Ireland*, Dublin: Higher Education Authority and Committee of Heads of Irish Universities.

Skill (National Bureau for Students With Disabilities) (1997) *The Co-ordinator's Handbook.* London: Skill (http://www.skill.org.uk).

Stake, R. (1995) *The Art of Case Study Research*, London: Sage Publications.

TechDis (2003) 'Virtual learning environment user testing project', available online at http://www.techdis.ac.uk/resources/files/VLE002.html (accessed 22 July 2005).

Union of Students in Ireland (2003) *The Health of Irish Students*: College Lifestyle and Attitudinal National (CLAN) Survey. Available online at http://meas.ie/easyedit/files/Clan%20Survey.pdf (accessed 12 September 2007).

Wenger, E, McDermott, R. and Snyder, W. (2003) *Cultivating Communities of Practice*, Harvard: Business School Press.

Wiles, K. and Core, J. (2004) 'Strategising e-learning', available online at http://library.open.ac.uk/aboutus/seminars/strategising_elearning_finalsent.pdf (accessed 21 July 2005).

Yin, R.K. (1994) *Case Study Research – Design and Methods*, 2nd edn, London: Sage.

Figure 1

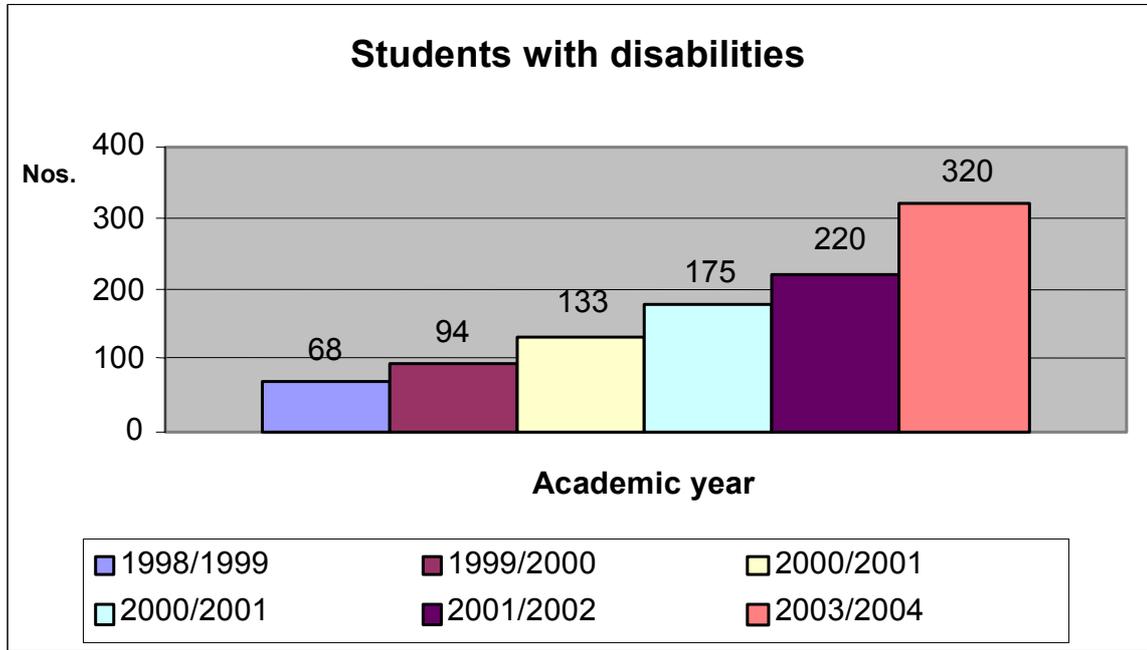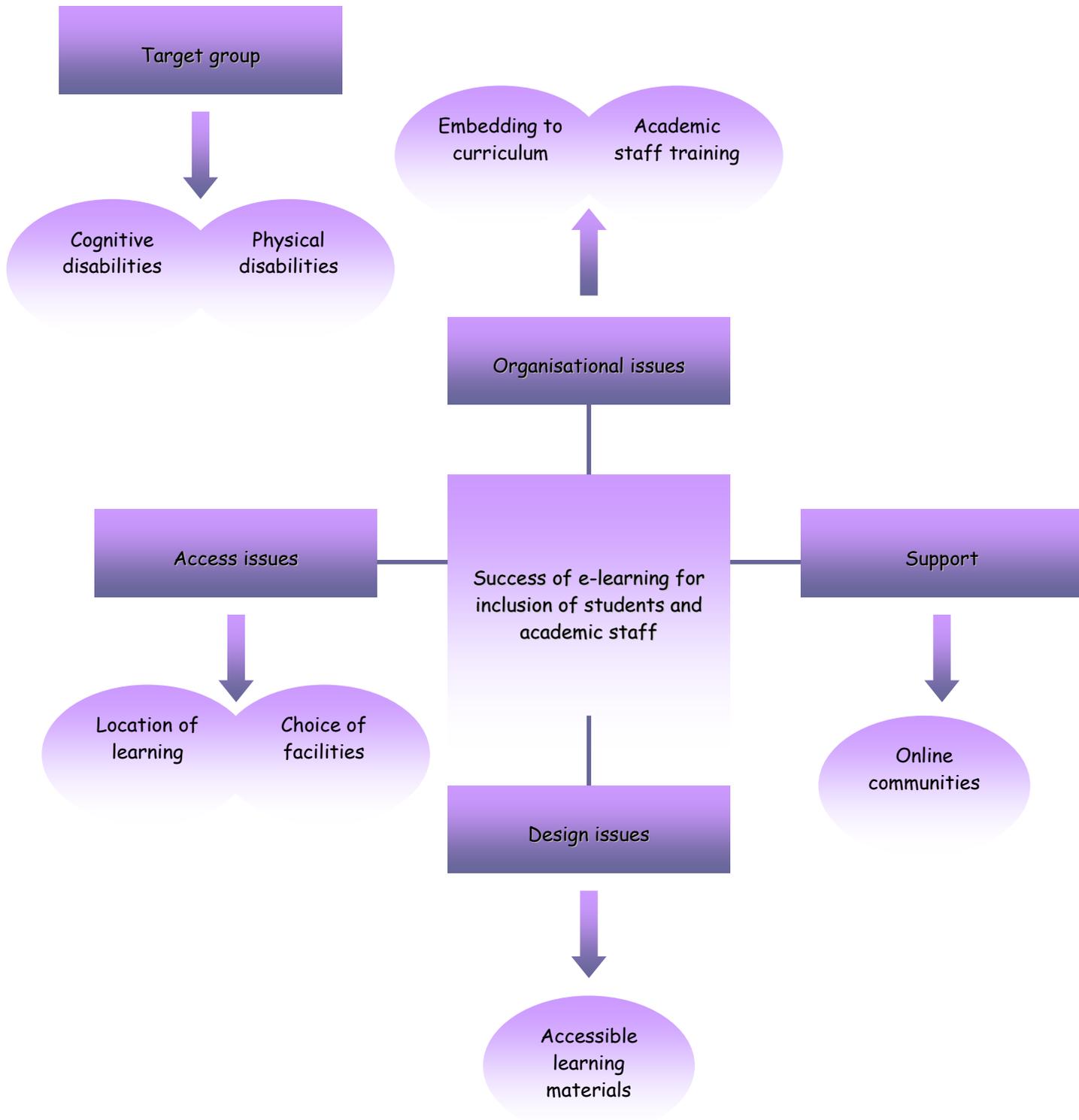Number of students with disabilities (registered with the institute's disability service)

Students with disabilities

Nos.

Academic year	
■ 1998/1999	■ 1999/2000	□ 2000/2001
□ 2000/2001	■ 2001/2002	□ 2003/2004

Values shown: 68, 94, 133, 175, 220, 320

Figure 2

Framework for implementation of e-learning supporting inclusion in higher education learning and teaching

Appendix A

Focus group guide

- This focus group was designed to investigate issues surrounding physical disabilities including dyslexia, visual impairment, and mobility problems and how e-learning provision can assist these students and staff within this institution. The questions used are open and invite your opinion, please feel free to concentrate and expand on areas that you feel are more important and relevant to you and indicate why you feel other areas are less so.

- These are a number of narrowly focused questions based on the above areas that are addressing the research interest of this research project.

- The group size is fairly small to match the project goal of obtaining a more in-depth understanding of what you as participants have to say.

- As we are limited to one hour, you may find it useful to each take turns offering your opinion on the questions in this guide.

Research outcomes

This research study plans to use the outcomes to produce:

- guidelines for developing inclusive e-learning materials;
- development of example inclusive e-learning materials;
- dissemination through a workshop and potentially, through appropriate journal papers.

Research conditions

- Information obtained will be used only in the context of the research study and will not affect the treatment of the participants by any person or institution.
- The identity of the participants are not requested and any information disclosed by the participants will be anonymised.
- Completed transcript will be not be circulated or viewed beyond the researcher and her assessor. It is anticipated that quotes from the transcript may be used to illustrate points.

Personal details

Participant's ID   To be assigned by the Researcher

Gender   ☐ Male ☐ Female

Group   ☐ Academic Support ☐ Student Support

Responsibilities

Dept/Centre

Target group

1 What type of disabilities do you think e-learning technology can best support?

2 What current provision does the institution have to meet this e-learning support?

Organisational issues

3 How can current staff training be enhanced to support inclusion of students with disabilities?

4 How would you embed e-learning support for students with disabilities into the curriculum?

5 How do you feel about the use of e-learning technology (email, mailgroups, discussion boards) assisting learners and staff to support each other?

6 What technical support do you envisage necessary for sustaining e-learning provision for students and staff with disabilities?

Type of e-learning and access issues

7 Comment on these types of e-learning technologies – how can they be utilized to support the learning of students with disabilities?

- Simple delivery of the learning materials to the learner (downloads the package and works with it interactively on their own)
- Lecture notes and visual aids being placed on the internet
- Using the internet as a library of resources (online journals, databases, reports etc)
- Communication links between student and tutor
- Communication links between learners to provide mutual support
- Communication between tutors to provide mutual support
- Frequently asked questions web sites
- Virtual seminars and conferences
- Video and audio conferencing to provide face-to-face support for learners in remote locations, or at a distance from the tutor

8 What access issues do you perceive existing for using such technologies effectively within and outside the institution?

E-Learning and content accessibility guidelines

9 How do you feel the current guidelines available for staff developing computer or web-based learning materials could be enhanced?

For example, if lecture notes or additional reading are put on the web.

10 a. Do you agree with the following guidelines?

1 strongly agree, 2 agree, 3 neither agree, nor disagree, 4 disagree, 5 strongly disagree

	1	2	3	4	5
i) Allow the user control of font size and style, background and text colours.	☐	☐	☐	☐	☐
ii) Avoid strongly coloured or patterned backgrounds.	☐	☐	☐	☐	☐

iii) Use clear structuring of text to form left justified paragraphs.

☐ ☐ ☐ ☐ ☐

iv) Use clear and concise language and easy to understand graphical cues.

☐ ☐ ☐ ☐ ☐

v) Design pages so that they can be read by a screen reader.

☐ ☐ ☐ ☐ ☐

vi) Allow the user to turn off any animated or timed elements.

☐ ☐ ☐ ☐ ☐

vii) Use consistent layouts and formats.

☐ ☐ ☐ ☐ ☐

viii) Provide context and orientation information.

☐ ☐ ☐ ☐ ☐

ix) Front-load information (i.e. indicate what a section contains at the beginning).

☐ ☐ ☐ ☐ ☐

x) Use white space so that the text does not look cluttered.

☐ ☐ ☐ ☐ ☐

xi) Place hyperlinks at the end of a piece of text instead of scattered throughout.

☐ ☐ ☐ ☐ ☐

xii) Provide a brief description of where a hyperlink will lead and why it is there.

☐ ☐ ☐ ☐ ☐

10b Is there any additional guidance or advice you could suggest about preparing inclusive learning materials?

11 If we look at specific teaching methods used in e-learning throughout the institution, what have you seen as particularly helpful or problematic about the following:

a) Lectures?
b) Tutorials?
c) Seminars?
d) Online materials?
e) Other aspects of e-learning?

Student support: visual impairment and technology

Next we will unpack what is happening in terms of e-learning support for students and staff with visual impairment.

12 Can you explore the role of assistive technology currently in e-learning in the institution? e.g. screen readers, magnification, Braille technology, scanners; in addition, can you add in your thoughts on accessibility and usability issues of the OLE the institution is supporting, namely WebCT, and its content.

Student support: physical disabilities and technology

13 Comment on using computer conferencing (online discussions) to lessen communication barriers for persons with physical disabilities. How do you see this happening in DIT?

General

14 In terms of current research and practical developments in the area of e-learning supporting students and staff with physical or cognitive learning difficulties, have you any other information that would be pertinent to this study?

15 Our purpose today was to discuss issues relating to e-learning and inclusivity within the institution currently on offer to students, staff and support provision. Is there anything else you would like to say either related to the areas covered by this study or in addition to it?

Further participation

16a Would you be willing to be contacted about further participation with this project?

16b If so would you please provide your contact details (e.g. Name and e-mail address)

Name:

Email: