

Completion Report Template

Each project is expected to submit a completion report *instead of* a final project report. It should be written with reference to the project plan, as in effect, the completion report closes a process that started with the project initiation document.

Project Name	Disabled Learners' Experiences of e-learning (LExDis) University of Southampton
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Acknowledgements	We would like to acknowledge the significant contributions that the LEXDIS external evaluators, advisory group and participants have made to this project. They have inspired, encouraged and supported us throughout a thoroughly enjoyable two years! Andy and Russell we would also like to acknowledge your unstinting support with the database and website development throughout the project and we are incredibly sad to have to report that James (who worked on the area where data is added to the web pages) died earlier this year - we have a prize in his name and we will never forget his wonderful support throughout http://blog.lsl.ecs.soton.ac.uk/lexdis . We would also like to thank the Support and Synthesis team, in particular Ellen Lessner, for their help during the life of the project.
Date of report	28/02/09

Section One: Executive Summary

The overarching aim of the LEXDIS project was to explore the e-learning experiences of disabled learners within one institution; The University of Southampton. The approach taken was one of participatory research with total involvement of the students who agreed to join the project from 2006 – 2009. The learner voice has not only mattered to the team but has shaped the entire project. From the design of the initial research questions to the formation of the end product – an online database of strategies provided by students to share with staff and peers.

The design of the database has been developed to fit with how students perceived the difficulties that arose with the tasks they were undertaking during their studies. It has not been so much about individual disabilities but rather more about specific issues that can cross the divide of the labels used in a medical model of disability. The concept that disability should move away from the medical model is not new and the acceptance that barriers occur due to the environment in which we work has often been discussed. (Llewelyn, & Kogan, 2000)

The user-centred participatory methods engaged by the LexDis team not only produced rich in-depth descriptions of the e-learning experiences of disabled students through their

own case studies but also an immensely diverse range of strategies using a pool of technologies that included standard assistive technologies and also innovative ways of using mobile and interactive Web 2.0 type applications. These particular learner experiences have helped us to develop guides and further information for teaching and support staff so that they may address, with some confidence, the issues faced by disabled students in higher education.

One goal was to increase our understanding of the many complex issues and interactions introduced by disabled learners' requirements for accessible e-learning, compatible assistive technologies and effective learning support. We discovered that in many ways that not only do **disabled students find ways of overcoming barriers with a degree of digital agility**, but they are also **making definite digital decisions as to how to approach issues**.

Disabled students **work in individualistic ways depending on their learning preferences, skills and abilities** and they **gain from interactions with technologically knowledgeable members of staff and peers** in a similar way to other students. However, they also realise that **time is a constraint that is a more persistent worry than may be the case for others**. Time has to be managed carefully and the impact of the increased amount of data available for research and learning can become alarmingly stressful unless organised with due care and diligence.

Our initial plan stated that "this project will have an impact on wider participation and ease transition issues for those requiring equal access to on-line teaching and learning." This has been shown to be the case with funding provided by the university to work with new members of staff and those across all faculties by developing packs to support accessible learning materials and the encouragement of students to include the LexDis project as part of a Freshers' introductory directory – Jumpstart.

As has been said the LexDis students were often digitally agile and made important digital decisions regarding their work, so we feel it is important that staff recognise this digital literacy and provide the opportunities for improved learning outcomes through the provision of an increased choice of online media resources.

Disabled students working in individualistic ways depending on their learning preferences, skills and abilities has been illustrated through a wide range of strategies provided and it has also shown us how assistive technologies must never be thought of as just those technologies designed specifically for disability. However, LexDis participants often depended on support from those who knew about new technologies or friends who had developed quick tricks with devices and software in the past, just like others on their courses. They also realise they cannot be distracted by events and issues such as always trying new technologies, as on the whole it takes them longer to complete tasks even though they may already be using assistive technologies. Time management is not a skill that comes naturally to some students especially those with specific learning difficulties such as dyslexia.

Project presentations such as that offered by Jane Seale this month highlight all these comments - The e-Learning Experiences of Disabled Learners – Download PowerPoint presentation or view in HTML at <http://www.lexdis.org/project/presentations>

Section Two: Project Outputs

Case studies / Learner profiles: 30 case studies describing disabled learners' different experiences of learning and the role e-learning and other technologies plays in those experiences can be found linked to each of the strategies discussed by students in the LexDis database <http://www.lexdis.org> The case studies are also available in Word format within the final report available on the LexDis Project website at <http://www.lexdis.org/project/reports>

Guidelines or recommendations: These are also available on the LexDis database <http://www.lexdis.org/guide> divided into those that are available for staff to encourage the development of accessible e-learning materials. Those that provide information about on-line learning best practices including DDA compliance. Those that offer guidance related to use of technology. In many cases these guides can be used by managers, academic staff, those supporting students, technology developers and facilitators as well as students especially postgraduates who may be teaching and presenting their research.

Methodological report and critique: This was completed in June 2008 and is available on the LexDis Project website <http://www.lexdis.org/project/reports>

Database of learner strategies: The LexDis database has been launched and is available at <http://www.lexdis.org> You can browse links to

- Guides (<http://www.lexdis.org/guide>) for staff and students to help make e-learning materials easier to use and accessible. Some guides have been developed to aid DDA compliance.
- Applications (<http://www.lexdis.org/application>) that students use during their online learning that may cause issues.
- Assistive Technologies (<http://www.lexdis.org/technology>) that students use with their strategies to solve some of the issues arising.

You can search by selecting difficulties and/or tasks to find strategies.(<http://www.lexdis.org/search?difficulty=-1&task=-1>) or entering a keyword in the search box.

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Section Three: Protect Outcomes

The Themes related to LexDis were taken from the JISC Learner Experience Phase 2 wiki <https://mw.brookes.ac.uk/display/JISCle2/Themes>

Access – Questions around this theme related to:

- How do specific groups of students - such as students with disabilities, international learners and work based learners - experience learning with technology?
- How do students use their personal technologies to access learning opportunities? How do they use the technologies made available to them through their institution?

All the LexDis participants used a computer every day along with email and the Internet. All the participants customised their computer in some way; particularly toolbars and menu items and the print size on screen. The majority of participants owned a mobile phone and a laptop, used instant messaging; participated in discussion forums; used social networking sites such as Facebook and uploaded videos or photos onto the Internet. All the participants used search engines such as Google, accessed online learning materials of some kind; used word-processors and spreadsheets and contacted tutors using email. When asked to rate their confidence in using technologies; where 0 was not confident. 10 was highly confident; the average rating was 8.5 (mean & median). (For a more detailed analysis with diagrams and graphs please refer to the final report available on the LexDis website at <http://www.lexdis.org/reports>)

The actual number and type of technologies used for e-learning by students can be found under the list of Assistive Technologies on the LexDis database <http://www.lexdis.org/technology> Some of the technologies that were available on the university server are listed under Applications. <http://www.lexdis.org/application>

Personalisation

When making decisions and expressing preferences about whether and how to use technologies to support learning, a number of influencing factors were identified:

- **Personal factors** included wishing to keep things simple, not being aware of the DSA so not having funds and using 'free technologies', wishing to be independent, having the skills and digital literacy to make the most of the technologies, and not wanting to make people aware of any difficulties or making a fuss.
- **Affordances of technologies** included how relevant the use of a technology may be to their learning or computer use, how efficient it would make them thus saving time, and whether it would produce results and further their prospects.
- **Properties of technologies** were related to how accessible they were, whether they were easy to use and pleasing, better than another product, reliable and useful for learning or in some case specifically for personal use – Facebook as opposed to Blackboard.
- **Circumstances** such as whether a lecture was worth recording or being allowed to use a recorder. Having to submit items on-line or using PowerPoint slides in a certain way.
- **People** were praised in terms of the type of support they offered, their expertise and whether they were on-hand when issues arose with technology. There were concerns when training was not appropriate or appeared to be unavailable or poorly timed. Peer support was helpful when difficulties needed instant attention as was the person on the other end of a phone.

Personal factors and the affordances and properties of technologies appeared to influence decisions about technologies more than circumstances and people.

Change and transition – Critical moments. This was related to the question - Are there particular moments or events that have changed the way disabled learners have used technology in their learning? Very few students provided precise moments during their learning journey related to technology, although some said getting the Disabled Students' Allowance was a turning point or receiving a computer, being able to type rather than handwrite essays. Scanning/OCR, Dragon NaturallySpeaking, Text to speech and mind mapping were also mentioned as particular types of technologies that had had an impact rather than an occasion. However, there were also the negative moments such as finding Blackboard hard to access or losing all ones work having not backed it up or the technology breaking down and therefore losing confidence in its use. There were also moments of stigmatisation such as feeling that taking a recorder to the front of a lecture hall marked one out as being dyslexic or not having the right access to specialist equipment at the right time. Three students said there were no particular moments as they felt they had grown up with the technologies.

Specific learners/context disabilities - possible issues unique to disabled students

- Having to **cope with new assistive technologies** to assist learning at the beginning of a university career when there are so many other issues that can cause concern.
- Having **less time compared to other students** to work online due to time taken up coping with issues related to disability.
- Having to **make decisions about which technologies** to use when (if at all) because of time constraints, personal skills and ease of learning.
- For some there is a **dependence on assistive technologies** to maintain independence.
- **The need for accessible digital versions** of documents is often essential rather than merely helpful to learning.
- **Being presented with inaccessible paper based or online documents** wastes valuable time for example having to scan secure or complex PDFs and diagrams for use with text to speech or for making annotations.
- **The need to juggle technologies** more effectively and in an agile way to assist learning e.g. using three different magnifier programs if the favoured one is not available or linking mobile technologies to the computer to ensure appointments are not forgotten.
- **Making use of free, social or mobile technologies** but having to consider accessibility e.g. accessible mobile phones - Nokia Sport 5500 with speech recognition and text to speech or free software as it offers a better planning option. LiveJournal for reflective diary/blog, Opera browser with increased mouse access compared to Internet Explorer. Aids for remembering when writing is difficult - Use mobile or digital cameras - picture of text captured as a memory aid. Others downloaded or used with text to speech. Mobile phone voice memos for personal reminders.

Students also discussed issues that arose with particular difficulties linked to the use of computers, and online teaching and learning materials including:

- | | | |
|-------------------|-------------------|----------------------|
| • Desktop options | • Planning | • Presentation tools |
| • Input options | • Organisation | • References |
| • Output options | • Notes and ideas | • Internet Browsers |
| • Colour changes | • Multimedia | • Communication |
| • Language | • Science issues | |

Disabled students need to have a certain degree of digital agility and digital literacy to be able to make relevant digital decisions or choices due to time constraints, their own skills, available training, personal difficulties and suitable technologies to support their needs in terms of the curriculum tasks undertaken.

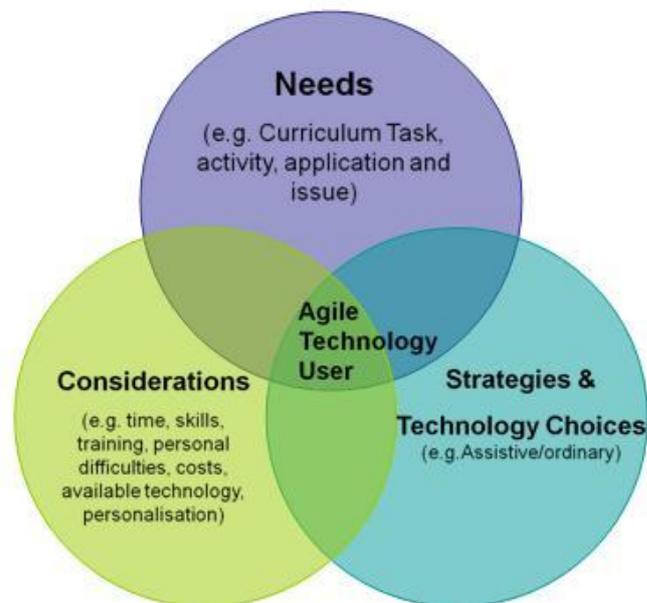


Fig 1. This figure illustrates the needs, constraints and choices that have to be considered by an agile user of technology as discussed above.

Institutional level practices

The results from the LEXDIS project offer examples of empowered choices being made by disabled learners; for example choosing to use the Assistive Technology services as this area has knowledgeable staff on hand during the day and is a quiet area with specialist technologies available, making use of the study skills offered by the Learning Differences Centre or help when provided by personal tutors or academic members of staff to help with specific programs. However, there are also times when students are choosing not to access support because they have a preference for learning by trial and error. The data also suggests areas that would be worthy of further exploration in terms of understanding whether or not the decisions made are actually empowered ones or not. A good example of this would be the decision not to access support to learn how to use assistive technologies for fear that it will take time away from learning. A greater exploration of this dilemma or catch-22 for disabled learners would enable practitioners to evaluate potential implications such as the possible need for support services to acknowledge the fears regarding time, but also provide meaningful and relevant information about how much “time” might be saved in the long run in terms of efficiency and improved learning outcomes.

Section Four: Dissemination

PowerPoints from many presentations given by the LexDis team can be found on the Project website at <http://www.lexdis.ecs.soton.ac.uk/project/presentations>

Lexdis is a Learning Impact Awards Finalist at the IMS Barcelona conference May 2009 <http://www.imsglobal.org/learningimpact2009/liafinalists2009.html>

The School of Electronics and Computer Science at the University of Southampton ran the

project as a news item on 26/02/09 <http://www.ecs.soton.ac.uk/about/news/2347>

The LexDis project was mentioned in the JISC pullout as part of the Guardian Newspaper 02/12/2008. <http://www.guardian.co.uk/digitalstudent/good-news>

There is a podcast about LexDis as part of a JISC feature 'The Accessibility Files - the technology is out there' by Kerry O'Neill from the JISC Marketing and PR team. <http://www.jisc.ac.uk/news/stories/2008/11/accessinclusion.aspx>

Documents on the LexDis website have been added to the EdShare database for further dissemination <http://www.edshare.soton.ac.uk/view/keywords/LexDis.html>

Google searches using the words 'LexDis' and 'disabled' results in around 770 accurate links to the LexDis project including mention in a few personal blogs e.g. <http://learninglab.lincoln.ac.uk/blogs/sue/2008/10/24/accessibility/>

The team have provided several workshops within the University of Southampton and the following external workshops and conferences have been attended to disseminate the LexDis project.

Conference Contributions – Refereed

Wald, M., Draffan, E.A & Seale, J (2008) Disabled Learners' Experiences of E-learning. In, *Proceedings of EdMedia 2008*, Vienna, June- 30th- July 4th 2008. Norfolk, VA, AACE

Journal Papers

Wald, M., Seale, J & Draffan. E.A (2009) Disabled Learners' Experiences of E-learning. *Journal of Educational Multimedia and Hypermedia*.18:3 In press.

Seale, J., Wald, M & Draffan, E.A (2008) Exploring the technology experiences of disabled learners in higher education: challenges for the use and development of participatory research methods. *Journal of Assistive Technology*, 2,3,4-15

Official Reports

Seale, J., Draffan, E.A & Wald, M (2008) An evaluation of the use of participatory methods in exploring disabled learners' experiences of e-learning. LEXDIS Methodology Report to JISC. Available from: <http://www.lexdis.ecs.soton.ac.uk/research/>

Seale, J., Draffan, E.A & Wald, M (2008) Exploring disabled learners' experiences of learning, LEXDIS Final Report to JISC Available from: <http://www.lexdis.ecs.soton.ac.uk/research/>

Major conferences

July 2009

Jane Seale gave a seminar on 4th Feb at Bournemouth university and is an invited speaker at the HCI 2009 conference in San Diego (in July where she will use LEXDIS results to demonstrate how her contextualised model of accessibility can be applied. <http://www.hcii2009.org/viewSession.php?id=210&date=1&time=2>

January 2009

Bett 2009 provided E.A. with the chance to discuss some of the strategies used by the students taking part in the LexDis project.

November 2008

JISC Online Conference. 4th -7th November Joint Paper Presentation: 'Listening to the Learner' <http://www.jisc.ac.uk/elpconference08>
September 2008

Accessible Design in the Digital World 08, York, Joint Paper Presentation. Reflections on the value of participatory research methods in developing accessible design in higher education <http://www.addw08.org/>
September 2008

Accessible Design in the Digital World 08, York, Joint Paper Presentation, A toolkit for signposting "access for all" based on student experiences of online teaching and learning practices <http://www.addw08.org/>
September 2008

Association for Learning Technology Annual Conference, Leeds, Joint Paper Presentation, Nothing about me, without me: The use of participatory methods to give voice to disabled learners experiences of e-learning. <http://www.alt.ac.uk/altc2008/>
September 2008

Association for Learning Technology Annual Conference, Leeds, Joint Paper Presentation. Hear my voice: Disabled E-Learners Narratives of Exclusion and Inclusion <http://www.alt.ac.uk/altc2008/>
June 2008

EdMedia 2008, Vienna. Joint paper presentation. Disabled Learners' Experiences of E-learning. <http://tinyurl.com/2sj3du>

Other Conferences

2009 – JISC workshops and conference, ALT Accessibility and
30/10/2008 RSC Southeast ILT Fair - Interactive session on Student Voices
<http://www.rsc-southeast.ac.uk/index.php?p=971>

24/10/2008 Scottish Adult Dyslexia Conference (Understanding the Difference) at the Stirling Management Centre (University of Stirling),
<http://www.adultdyslexiaconference.org.uk/Conference.html>

21/10/2008 UCISA Managers Forum (Supporting users with disabilities) at the Aston Business Centre (University of Birmingham)
<http://www.ucisa.ac.uk/groups/exec/Events/2008/managersforum1.aspx>

20/10/2008 Learners with Learning Difficulties and/or Disabilities Meeting (Update on Student Technologies for E-learning) at the Learning and Skills Council, Brighton

17/9/2008 NADP Assistive Technologies Conference - The Future of Supporting Students through Technology <http://www.lexdis.ecs.soton.ac.uk/presentations>

17/7/08 LLU+ professional development centre, London South Bank University Workshop
<http://www.lsbu.ac.uk/lluplus/>

8/7/2008 e-learning@greenwich/conference - University of Greenwich and 'Enabling Learners' Voices' by EA Draffan and Gemma Towle
<http://tinyurl.com/26omxp>

24/6/2008 NADP Annual Conference <http://tinyurl.com/2ke3ss>

04/6/2008 Southern Higher Education Dyslexia tutors (SHED) <http://tinyurl.com/5pc6pr>

27/3/2008 BDA International Conference <http://tinyurl.com/34qlfq>

Section Five: Key Messages

Key messages from the LexDis project that we would like to see inform future work are:

- Policy and practice in further and higher education sectors should include an awareness of the skills and abilities of disabled students, the digital decisions they have to make regarding choices and take a flexible approach to the provision of

alternative formats for all students as well as allowing more access to computer system accessibility options across campus networks.

- Future learner experience research should include exploration into the reasons for some of the digital decisions made by disabled students such as training choices, application choices and use of Web 2.0 (interactive online) resources that have been found to particularly easy and actively encourage reflection and collaboration.
- The design and development of an integrated online teaching and learning toolkit that contains examples of accessible and easy to use groups of technologies resulting from the research above.

Section Six: Synergy & Sustainability

From early support and synthesis meetings the LexDis project has collaborated with the E4L project in sharing data and interview and coding methodologies with NVIVO as well as a combined student learning profile resulting in some strategies for the LexDis database. Interview practices were shared at the Greenwich conference and it is hoped that a paper will be published as a result. EA also visited the LEAD project as part of the work that veterinary students had to undertake and the impact this may have on dyslexic students.

It is hoped that after February 2009 we will be able to include more strategies from students whilst we support staff by offering a wide range of teaching and learning materials online. These will not only be related to Microsoft office products and PDFs but also Web 2.0 type applications. Links with the JISC TechDis service and other JISC projects especially Phoebe (<http://phoebe-project.conted.ox.ac.uk/>) would allow us to associate pedagogical technology needs to guidance provided for issues that arise for disabled students when working online. It is hoped that by linking with other projects in the sector we would also be able to provide strategies regarding the use of technology not only by individual students but also through colleges and universities for example RSC Yorkshire and Humberside (<http://inclusivity.rsc-yh.ac.uk/>) and the JISC TechDis Heat scheme (<http://www.techdis.ac.uk/getheatscheme>).

Section Seven: Issues and Challenges

Initial issues or problems that it was thought would impact on the development and implementation of the project included fears about being able to work with a sufficient number of students. This issue did not materialise and towards the end of the project it became clear that although we had 30 student learner profiles (case studies) we actually had 32 students willing to provide strategies and a few more in the wings which have been included in the database.

The process of building the database of resources took longer than expected as at each step students' opinions mattered. There was an increased amount of data to work through, as a result of the willing involvement of participants. However, having talented computer scientist students on the project meant that the data entry section of the database and the website was built by participants. One participant was also working on his MSc and included the accessibility of the audio and video player as part of his research.

Participants often went out of their way to supply the project with artefacts which has meant that they have come in very different media types. Conversion of audio files and

videos or flash animations is on going with some strategies providing considerable accessibility challenges such as flash files with no video option or audio as they were a series of screen grabs. Some screen grabs remain of rather poor quality and the same applies to some audio files, but it was felt that as they were part of the student contribution this should not be considered an issue.

Early on in the project's life it was accepted that for many different reasons students did not always want their photographs to be available online so they chose meaningful pictures for their case studies.

One major challenge was how to represent the fact that students rarely discussed their disabilities in relation to the issues that arose and the strategies they developed. Several evaluators (or critical friends) with educational links commented on the lack of disability information. It was decided that keyword searches related to disability would present appropriate data and these would be linked to appropriate difficulties mentioned by the students. As we worked with the students it became clear that they considered that their difficulties were related to particular tasks. This is not surprising when you consider a disability such as dyslexia (which is often felt to be a difference rather than a disability) and participants were more likely to talk about a difficulty reading from the screen or planning and organisation or written language. All these difficulties could also apply to students with visual stress or visual impairment and even pain and fatigue due to mental health issues.

Advice

When considering a participatory project of this nature allow plenty of time to work with the students and then double the amount of time to work through the data in particular where transcriptions are part of the research.

Be aware of students' views about the project and work with these ideas so that the results complement their beliefs regarding the final outcome. In the case of the LexDis project this was an overwhelming desire to help other students and inform staff.

There is a need to be willing to try several programs to make artefacts accessible and easy to use on all platforms as well as spending time to provide alternative formats where necessary, so for instance all audio files have a transcription. Videos need descriptions and transcriptions or captions if they include audio.

If you are building an online database do not forget to have a clear schema at the outset but be prepared to adapt it to fit with changes over time and be aware how this may impact on the final website. Have a series of ways of checking input data and being able to find resources as well as providing filters within categories. This will prove invaluable as the database grows

Build a team that has different skills so all aspects of the project can be covered – from technical skills to academic report writing skills.

Be aware that dissemination takes time so it is important to build this up from the outset.

Section Eight: Support

The LexDis project team were lucky to have a fairly prescriptive type of project that had a clear remit and this helped us to focus on the work involved. However, the work undertaken by the support and synthesis team to introduce ideas such as the use of NVIVO and the wiki to track progress has helped. Although at the outset both these items caused extra work, as the project progressed it was clear that these applications acted as useful reminders and when it came to report writing proved to be invaluable.

The personal contacts, e-mails and workshops all helped to produce a sense of community and aided collaboration as well as a way of networking and sharing issues. Summary e-mails and updates from Ellen have proved invaluable when it comes to keeping in touch and making one more aware of other project outcomes.

The new templates for the project reports have been very helpful along with the guidance on the wiki. The timing of the reports seems to have worked well with our project meetings with Rhona or Ellen and Sarah although it can be hard for all of us to make every meeting.