Digital Education Strategy
2016 – 2020

April 2016

From the Pro-Vice-Chancellor (Education) Professor Sally Mapstone

The University's Digital Education Strategy establishes a framework for engagement and creativity in this important area of education and innovation. The way that students are experiencing education at universities is changing rapidly. The traditional forms of the lecture, practical, class and tutorial face-to-face teaching remain central to what we do at Oxford, but are far from the only choices available, and can be varied and enhanced. In order to maintain Oxford's place amongst the premier institutions in the world for teaching quality we need to evaluate new forms of education, support the most valuable, and provide guidance for students and staff as they adopt them.

Credit: Copyright John Cairns
Photography

This Digital Education Strategy sets out the necessary structures, resources, and approaches to enable the University to set about this. The Strategy acknowledges the creativity and pursuit of excellence characteristic of our academic staff and those who support them. It is also conscious that time is a finite resource and that there are places where particular kinds of help are needed to generate and sustain innovation in the use of technology in our teaching. It thus emphasises the value of the academic divisions embedding technological support for digital education in their staffing structures.

The Strategy is the start of a programme of work, the aim of which is to bring about a step-change in our use of technology in teaching and learning. The choice of how to do this and what the local priorities are will be for divisions and their departments and faculties to decide. There are already many individuals who are experimenting with digital education, and a growing number of departments are expressing their aspirations for a more technology-enhanced approach to teaching. Our aim, expressed in this Strategy, is to ensure that the resources and expertise are ready and available to realise that ambition.

ACKNOWLEDGEMENTS

The Strategy was devised by a Working Group which met over the course of 2015. We are very grateful for their enthusiasm, support and ideas.

The Group was chaired by Professor Emma Smith (Faculty of English) and comprised the following members:

- **Mrs Lucie Burgess**
  Associate Director for Digital Libraries, Bodleian Libraries
- **Mr Nick Cooper**
  VP for Graduates and OUSU nominee
- **Dr Rebecca Eynon**
  Oxford Internet Institute and Department of Education
- **Dr Tim Lancaster**
  Director of Clinical Studies, and Medical Sciences nominee
- **Dr Stuart Lee**
  Deputy Director of IT Services
- **Ms Marion Manton**
  Technology Assisted Lifelong Learning (TALL), Continuing Education
- **Mrs Philippa O'Connor**
  Deputy Director, Education Policy Support
- **Dr Jonathan Prag**
  Classics, and Humanities nominee
- **Professor Robert Taylor**
  Associate Head of MPLS Division and Education Committee representative
- **Mr Dave Smith**
  OUP representative
- **Dr Dave Waters**
  Earth Sciences, and MPLS nominee
- **Dr Andrew White/ Dr Caroline Williams**
  Saïd Business School, and Social Sciences nominees
- **Dr Damion Young**
  Head of Learning Technologies, Medical Sciences Division

Advice was also sought and received from:

- **Ms Catriona Cannon**
  Deputy Librarian and Keeper of Collections, Bodleian Libraries
- **Ms Helen Charlesworth**
  Undergraduate Admissions and Outreach
- **Dr Jill Fresen**
  Senior Learning Technologist, IT Services
- **Dr Catherine Paxton**
  Director of Student Health and Welfare
- **Dr Nadia Pollini**
  Head of Graduate Admissions
- **Professor Mike Sharples**
  Chair in Educational Technology, The Open University

CONTENTS

In Michaelmas Term 2014 Education Committee approved the setting up of a Working Group to produce a Digital Education Strategy. The significance of the impact of technology on teaching and learning had been recognised in the University's Strategic Plan[1] and an explicit commitment had been made to develop a strategy for digital education. Behind this commitment was an understanding that the way students are being taught worldwide is changing rapidly as universities harness the power of digital technology to develop new ways to teach and to learn. The Committee was also conscious that up to that point Oxford had engaged unevenly with e-learning, being very much driven by the particular needs of individual departments and faculties or the enthusiasm of individuals. It took the view that institution-wide engagement was needed to bring about a more coordinated approach to new developments, and a better understanding of the benefits of technology use.

Another important consideration was future employment opportunities for our students. It was understood that these will often be driven by the development of digital technology and the creativity of individuals in this sphere. It was thus considered important to do as much as possible to equip our graduates for that future, ensuring that they are adept in the use of digital technologies, and encouraged to innovate and experiment. Embedding technology in their experience of learning is one way of supporting this.

The Working Group developed the Strategy over the course of 2015. The Strategy was formally approved by Education Committee in Hilary Term 2016.

---

[1] www.ox.ac.uk/about/organisation/strategic-plan

FIVE DEVELOPMENT AREAS

Digital education is understood to mean the employment of technology in the creation and curation of teaching materials in digital form, the design and delivery of teaching, and the engagement and interaction of students with learning through the medium of digital technology.

This digital education strategy begins with the principles that (a) the traditional forms of teaching and learning, such as tutorials and small-group teaching, have always been at the heart of the degree programmes we offer, and we should continue to enhance and maximise them; (b) that academic staff should be supported in innovating in teaching methods; and (c) that students should benefit from the increased learning opportunities that digital education offers.

An ambitious programme of developing all digital literacy in all academic departments and faculties, and of embedding current best practice more extensively across the curriculum, is proposed. Putting the 'education' more firmly into 'digital education' is a clear priority.

The strategy makes plain that high quality digital education requires investment of both time and money, and therefore digital developments should be targeted to support the University's wider strategic objectives (Annex A). It is concerned with and driven by teaching and learning priorities, and informed in large part by the innovative use of technology in our courses already to be found in departments, faculties and colleges. Although colleges are not covered by the university strategy, it is important to acknowledge a range of innovative digital work in which many are already involved.

The goal of the strategy is to ensure that in 2020 Oxford remains a premier institution for teaching, adopting the very best of teaching innovations that are made possible by digital technology.

There are 5 main areas that require development over the period of the strategy in order to achieve this goal:

Development area 1: to extend the areas of excellence in digital education that already exist and to ensure that all departments and faculties regularly review how digital methods might enhance their teaching and learning provision;

Development area 2: to use appropriate digital technologies to develop more inclusive provision for different learning needs;

Development area 3: to support academic staff as innovative teachers by developing the functionality and usability of key digital platforms;

Development area 4: to support students by making collections of resources more accessible and relevant to their learning;

Development area 5: to clarify and agree the resources needed to develop digital education, where these might be most effectively situated, and how best funded.

Collectively these developments will ensure that we use digital technology where it helps us to maintain Oxford's place among the premier institutions in the world for teaching quality; widen

access to our courses; provide students with a top-quality experience; and improve their employability including as future academics in the digital world. Each area of development is supported by a number of recommended actions shown in bold. This strategy is intended to run two years beyond the end of the University's current Strategic Plan, for the period 2016 - 2020. Recognising that during this period the Strategic Plan will be revised, the strategy's duration is considered to be the minimum necessary to achieve its aims.

Development Area 1: To extend the areas of excellence in digital education that already exist and to ensure that all departments and faculties regularly review how digital methods might enhance their teaching and learning provision.

The University has reached a stage of maturity in curating traditional forms of teaching material in digital format, usually within a Virtual Learning Environment (VLE). The direction of travel in digital education is now envisaged as moving from creating materials for online study towards more interactive types of learning.

Technology can supplement, rather than replace, face-to-face teaching, and increasingly the distinction between face-to-face and digital education is becoming blurred as tutors and students use technology in the class and lecture room. The following are ways in which some colleagues are using technology to enhance traditional forms of face-to-face teaching.

CASE STUDIES

The lecture

Professor Sophocles Mavroeidis of University College, a lecturer in Econometrics: Adapting lectures on the fly with real-time questioning

http://blogs.it.ox.ac.uk/ltg-casestudies/?p=2074

Language teaching

James Robson, Wycliffe Hall: Bringing new life to an old language with a smart board

http://blogs.it.ox.ac.uk/ltg-casestudies/?p=1621

Lab work

Kevin Coward and Celine Jones, Nuffield Department of Obstetrics & Gynaecology: Mobile interactive board technology for wet laboratory practical teaching

http://blogs.it.ox.ac.uk/ltg-casestudies/?p=1150

Fieldwork

Thomas Jellis, School of Geography and the Environment: The Copenhagen fieldclass

http://blogs.it.ox.ac.uk/ltg-casestudies/?p=1123

Formative assessment

These are just some of a wide range of examples of innovative use of technology in teaching at local level, resulting from the particular needs of individual departments and faculties and/or the enthusiasm of individuals. Some of these have been recognised by the University in the annual OXTalent awards and IT Services provides over 100 case studies from amongst its previous winners (http://blogs.it.ox.ac.uk/ltg-casestudies/case-studies/).

SUPPORTING LOCAL INNOVATIONS

The University should continue to support local innovations by providing incentives and mechanisms for their development, and increase activity to maximise their impact.

More recently a number of projects have been specially selected for development by the IT Innovation (Seed Fund) Board. The criteria for the selection of teaching projects include innovation, response to identified University priorities and policy objectives, and potential for wider use (www.it.ox.ac.uk/innovation-fund).

This local innovation activity is a vital part of effecting a shift to wider use of technology to enhance teaching and it should continue to be encouraged through funding competitions and provision of technical support, and widely communicated to the academic community. Examples and resources collated online and regular events to showcase the use of technology should be employed to increase staff awareness and digital literacy, and to support those who wish to identify and deploy new techniques.

PRIORITIES AND TARGETS

All departments should be asked to set their own priorities for increasing the use of digital technology in enhancing education, and set out their targets for the next four years.

Technology use in teaching is now a normal expectation within the higher education sector and within the student population.

Not all shifts in the use of technology can, or will, occur at the level of the individual academic. Technology use in teaching is now a normal expectation within the higher education sector and within the student population. It should become part of the regular activity for departments and faculties to reflect on the ways in which their teaching could be enhanced, and to set timelines for embedding change. This normal cyclical activity needs to be kick-started with a setting of appropriate and beneficial priorities.

Setting local aims for digital enhancement is preferred and is likely to be most effective. This strategy document indicates some of the main areas for development and includes a number of case studies to illustrate these. The central services, principally Academic IT Services, the MSD Learning Technologies Group (MSDLTG) and Continuing Education's Technology Assisted Lifelong Learning team (TALL) can all support local plans by providing information about other options that are available. Departments and faculties should be asked to set targets for themselves for developing their digital provision and to report progress against them.

In devising their own response and implementation plan, certain considerations should be common to all:

a. In order to prepare our students for employment, including as future research students and academics, acquiring digital fluency should be part of every student's experience and should be integrated into their programme of study.

   Integrating digital skills training into every student's experience need not entail additional components of programmes of study. If programmes of study are sufficiently enriched with a variety of digital learning and teaching tools, students will experience technology as part of their working environment. Research in all disciplines is being transformed by digital technology and the methodologies used in research are broadening as a result. Research-led teaching that is inclusive of the most advanced research tools within their discipline will provide students with transferable skills for future employment or further academic study. Departments and faculties are strongly encouraged to ensure that students at all levels have substantial opportunities to use technology.

b. Departments and faculties should include students as partners in developing digital education priorities.

   The 2014 *Survey of Technology Enhanced Learning in the UK*, UCISA, found that feedback from students is cited as the most important factor in encouraging faculty to make greater use of technology in teaching. Students are, in the main, using technology for a wide range of activities in their everyday lives and their expectation of the University is strongly influenced by that experience. They will be quick to identify where improvements can be made, but will also have a lot of knowledge to share about tools and resources they find helpful. Students are also using technology creatively to support their own and others' learning and are frequent recipients of awards in the annual OXTALENT competition. Students should be included in the process of identifying departmental or faculty priorities and encouraged to be part of, or to lead, teaching innovation projects.

APPLICANTS TO ALUMNI

Departments and faculties are strongly encouraged to consider the role of digital education across the full range of their educational portfolio as part of their response and implementation plan.

The use of digital technology should be considered at all stages of the student 'life-cycle' i.e. from pre-application to alumni. In addition to the core teaching programme, digital technologies offer great potential for extending the University's reach in attracting and retaining applicants from

diverse backgrounds. Departments and faculties, together with the central outreach and admissions teams, are encouraged to consider the following:

- For prospective students, online taster courses could be used to encourage applications, widen access to include non-traditional students, and could be a way of establishing appetite for new curricula or programmes of study;
- For undergraduate offer holders, online courses can be a way to support transition from school to degree-level education; MPLS has extended its face-to-face bridging programme by digital means; in MSD, Biochemistry and Biomedical Sciences offer online pre-arrival maths material.
- For postgraduate offer holders, short introductory courses could differentiate Oxford from competing institutions, helping to retain the brightest and best;
- To widen access to undergraduate courses there is potential to extend the reach of teacher conferences through online support.
- There is also scope to widen access to undergraduate courses through online versions of the regional conferences and summer school activities that are massively oversubscribed.
- There is also potential for distance learning to deepen engagement with alumni, and offer fundraising possibilities e.g. through targeted and privileged offerings of online teaching material; by using links between alumni and current students. Recent graduates might also be encouraged to consider returning as postgraduates.

Development Area 2: To use appropriate digital technologies to develop more inclusive provision for different learning needs.

INTEGRATING INCLUSIVE PRACTICE

Local priorities for increasing the use of digital technology in teaching and learning should be devised with inclusivity in mind.

Departments and faculties should be aware of the potential that digital technologies hold to promote inclusivity in their educational programmes, particularly for students with disabilities. An Inclusive Teaching Project is underway under the auspices of Education Committee, to build upon the University's commitment, expressed within the Common Framework for Supporting Disabled Students, to adopt exemplary practice in fulfilling the Public Sector Equality Duty.

> *The philosophy of inclusive practice is to adapt practice to anticipate a wide range of needs so that it is no longer necessary to make alternative provision for specific groups of students.*

The philosophy of inclusive practice is to adapt practice to anticipate a wide range of needs so that it is no longer necessary to make alternative provision for specific groups of students. Digital approaches to education are often more inclusive (as long as the technologies deployed are themselves accessible). They are likely to enable students to engage with material at the time/s of their choice. They offer potential for students to review, annotate and organise material in meaningful and constructive ways.

An example of adapted practice using digital technology is the use of lecture capture. Lecture capture provides a means for all students to review lectures at their own pace after they have been delivered. As well as enhancing provision for all, for a significant number of students this could reduce the need for them to be accompanied to lectures and other teaching sessions by non-medical helpers. Details of the current lecture capture project are provided in Annex B.

There are a range of other possibilities for improving the accessibility and usability of teaching resources and teaching sessions with technology:
- Making available more reading / study material in a variety of accessible formats - either through existing digital resources, or facilities to amend and alter formats with ease;
- Providing opportunities for alternative submission and presentation of work and enabling a variety of ways for staff to provide feedback;
- Providing opportunities and platforms for distance learning and remote student/tutor contact and student-to-student collaboration where face-to-face work is not possible.

The University should anticipate adoption of assistive technology and the need to put in place training in its use for students and staff.

Additionally, the Director of Student Health and Welfare is engaging student consultants to evaluate the potential of study aid technology to help students with disabilities to succeed at Oxford. This might include technologies to help students manage their time and plan to meet deadlines, to take and organise notes from their reading, lectures, classes and tutorials, to plan written assignments with mind-mapping and other tools, to listen to material rather than reading it (text to speech), and to proofread work. (Students with disabilities are not the only group which could benefit from this technology.) Traditional approaches to providing assistive technology have sometimes failed because of the lack of ongoing support for students in its use; it is traditionally high cost and provided in a bespoke package for the student in line with the funding model for such support. With the funding model now being substantially altered, the University needs to consider from first principles how assistive technology should be provided and paid for, and how its use is best supported. A definitive conclusion cannot be reached in advance of the Director of SHW's report, but the University should anticipate demands for assistive technology to be available more inclusively on a site-wide basis supported by central training, and for local IT personnel to have the skills to support students on an ongoing basis.

> *The University should anticipate demands for assistive technology to be available more inclusively on a site-wide basis supported by central training, and for local IT personnel to have the skills to support students on an ongoing basis.*

3. KEY DIGITAL PLATFORMS

Development Area 3: To support academic staff as innovative teachers by developing the functionality and usability of key digital platforms.

Whilst support of a VLE will continue to be a key service provided by Academic IT Services (see also Annex C), additionally there are other key services that it is highly desirable central services should provide to support academic staff in delivering digital education. These include: a robust platform for online and distance learning; an infrastructure that enables flexible use of learning spaces; systems to support online submission and assessment; and a lecture capture service (see Annex B). The academic rationale for these services is given below.

REMOTE TEACHING

Support the development of remote teaching by provision of a robust platform, standard templates, and routinely available training on good practice in distance learning.

A number of situations present themselves where prospective and/or current students could benefit greatly from an extension in the use of distance-learning, and there is appetite among academic staff to offer this support. There will also be a limited number of cases for programmes delivered entirely by distance learning: these are in a different category to the scenarios discussed here, and guidance for their development and delivery is provided within the *Policy framework for distance learning award-bearing PGT courses.* Outreach and recruitment and alumni relations are discussed in Applicants to Alumni above (page 10). The technology of distance learning could also provide better support for a range of registered students or those holding offers:

- Bridging courses for new undergraduates to encourage access;
- Enrolled students during vacation periods, on placements and electives, and on their year-abroad;
- Academic induction for those on short master's courses
- Pre-sessional English Language courses
- Academic support for part time graduate students
- Small Private Online Courses (SPOCs) that typically involve students on campus and a selected group of students at another institution, introduce alternative perspectives on a topic benefiting both student groups.

CASE STUDIES IN DISTANCE LEARNING

The MPLS online Maths bridging course: supporting transition to University: http://blogs.it.ox.ac.uk/ltg-casestudies/2015/10/13/mpls-maths-bridging/

Department of Continuing Education: Online short courses: moving weekly classes into the future: http://blogs.it.ox.ac.uk/ltg-casestudies/2015/10/15/online-short-courses/

Streaming lectures with WebEx: medical students on placement

http://blogs.it.ox.ac.uk/ltg-casestudies/2013/09/30/streaming-lectures-with-webex/

Weblearn for Conservation Statistics: a short course upskilling conservationists in the field

http://blogs.it.ox.ac.uk/ltg-casestudies/2015/07/20/weblearn-for-conservation-statistics-a-wild-success/

ENGAGING A WIDER AUDIENCE

Those wishing to engage with a wider audience for their teaching, extending beyond enrolled students, should develop courses using one of the two VLEs currently in use (e.g. WebLearn or Moodle), supported by the appropriate University team.

The Strategy Group also considered whether it was important for the University to engage in larger scale, open, online education.

The University already makes accessible a huge range of open educational resources.

Oxford offers many things of interest to the wider public such as access to experts, to expert knowledge, and to unique collections and resources. The University already makes accessible a huge range of open educational resources (OERs) in the form of audio and video recordings http://podcasts.ox.ac.uk/open and teaching resources for schools: www.tes.co.uk/member/OxfordUniversity. Additionally our libraries and museums have invested substantially in opening their collections to the public (e.g. Digital Bodleian http://digital.bodleian.ox.ac.uk and Treasures of the Bodleian www.bodleian.ox.ac.uk/whatson/discover).

A potential next step in 'openness' is provision of courses to the public. Massive Open Online Courses (MOOCs) are now a feature of education offered by many of Oxford's key competitors and the Strategy Group gave particular attention to this development. Although the Group perceived some advantages that could accrue to the University through MOOCs, it was clear that these benefits were not unique to MOOCs, or to MOOC providers, and alternative activity could equally well achieve the objectives that some academic staff have in mind.

The University has two platforms that can support distance learning.

Online and distance learning at whatever scale needs a robust platform to support it. Currently the University has two VLE platforms in use that can support distance learning: Moodle in Continuing Education and Sakai (Weblearn) in all other departments. IT Services, working with OUP staff, has evaluated both platforms, and others, to see how they would support learning delivered at scale:

100k+ (a traditional MOOC), c10,000 (a SPOC, small private online course), and c1,000 (a reduced version of a SPOC aimed at internal users only). The evaluation has confirmed that both platforms currently in use would support courses of up to 10,000 participants and so would meet the immediate needs of the strategy. (Neither would support a MOOC, which would require signing up to one of the major MOOC platforms such as EdX, Coursera, or Futurelearn.)

The Group does not recommend that the University invest in independent MOOC development at this point, but rather invests in a range of other kinds of online teaching using existing platforms and open resources of the kind described above.

For those keen to widen access to their teaching or to reach a geographically dispersed audience, the alternative is to offer smaller but widely accessible online courses, SPOCs, which in practice can be much larger in scale than courses commonly offered by Oxford academics. Courses at this scale would be ideal for showcasing course content and providing snippets for linking to the prospectus.

> *Courses at this scale would be ideal for showcasing course content and providing snippets for linking to the prospectus.*

Increasing this activity presents two aspects that need to be managed: first, developing and delivering fully online education represents a substantial investment of academic time and some guidance is required about the extent to which this can be mitigated by use of teaching assistants and specialist external service suppliers such as those that manage online communities; second, there is a reputational risk in offering online courses of any length if they are not quality assured to the same standard as any other form of teaching that the University offers.

Those wishing to offer online courses, even where these are non-credit-bearing, need to put in place checkpoints, including:
- Ensuring that the course is 'owned' by the department or faculty: this could be by a system of approval at local level, and inclusion in the regular reviews of teaching provision by the department or faculty;
- Ensuring that the course works successfully by trialling and revising the course (with input from students and staff) and by incorporating an automatic student feedback system upon course completion;
- Ensuring that staffing arrangements for online courses meet Education Committee's expectations with regard to teaching resources[2] and safeguard the University's reputation.

There are three further areas where the central IT Services should be ready to support trends in teaching and learning that are already emerging in Oxford, and where it does not make sense to proliferate local arrangements.

---

[2] As set out in Education Committee's *Policy and Guidance on new courses* www.admin.ox.ac.uk/edc/policiesandguidance/pgnewcourses/

Support the development of an enabling infrastructure for the use of students' own devices in teaching events, and future-proof it.

Tools to allow computer sharing and collaborative working optimise the flexibility in the kind of teaching that can take place.

Students are increasingly bringing their own device (tablet, mobile phone or laptop) into the lecture room or classroom, as well as using them in their own study time. A combination of Bring Your Own Device (BYOD), internet access, and seamless system access potentially turns any room into a digital education room. Additionally, tools to allow computer sharing and collaborative working optimise the flexibility in the kind of teaching that can take place. Medical Sciences is currently trialling pop-up learning spaces with tablet technology (www.medsci.ox.ac.uk/support-services/learning-technologies/learning-teaching-and-asssessment/mobile-assessment-learning-spaces). To take this further, a consistent institution-wide service, beyond the network infrastructure, is needed when you envisage students constantly moving between colleges and departments. The infrastructure also needs to be ready for the next generation of devices.

Support the development of an enabling infrastructure for online assessment

There is increasing appetite on the part of academic staff and to some extent students to use technology in assessment. There are many instances of departmental interest in the provision of a platform for online submission of written work such as extended essays and project dissertations, and for it to be possible to mark this work online.

There is increasing appetite to use technology in assessment.

Additionally, over the past ten years, the Medical Sciences Division has developed great expertise in designing and delivering online assessment, enhancing the quality and reliability of assessment, and saving considerable amounts of academic time in marking in the process. The Division now delivers around 160 assessments fully online each year (representing around 17,000 individual sittings) of which 50 are formal University examinations. These are designed especially for the digital medium and are computer-marked. There are around 20 different question types available offering vast potential for assessment in other subjects in the University, particularly in the sciences and social sciences. The Division has developed an extensive set of resources to support Examination Boards (www.medsci.ox.ac.uk/support-services/learning-technologies/learning-teaching-and-asssessment/online-assessment) in addition to providing experienced learning technologist support. At the other end of the spectrum a small-scale pilot is planned in the Humanities division looking at how a traditional essay-based examination works when students are asked to word-process, rather than handwrite, their answers.

Provide as a core service a lecture capture platform and support to encourage the widest possible adoption

As outlined in Annex B, Academic IT Services recently ran a pilot project on the use of lecture capture technology to which 26 units in the University have subscribed. As well as enhancing the educational experience of students, use of such a system has great potential to advance inclusivity of provision as indicated in 2. Inclusive Provision, above. Because of its importance to Education Committee's Inclusive Teaching Project, Education Committee has recommended that a lecture capture platform and support be offered as a core service to encourage the widest possible adoption.

4. ACCESSIBLE AND RELEVANT RESOURCES

Development Area 4: To support students by making collections of resources more accessible and relevant to their learning.

NEW KINDS OF DIGITAL OUTPUT

The University should utilise the expertise of the Bodleian Libraries and the recommendations of the University-wide Resource Discovery Project to identify solutions to enable new kinds of digital output to be discovered, made available to the public, and to be re-purposed for teaching students.

There is a wealth of information and resources available to students via the web that can expand their learning, and also opens up possibilities for unique projects.

Outputs of research are now taking many forms, increasingly digital, and increasingly open access. Students' learning is unlikely to be confined to reading lists comprised of traditional printed outputs of research (monographs, journals) available in Oxford libraries. There is a wealth of information and resources available to students via the web that can expand their learning, and also opens up possibilities for unique projects. The University itself has a rich store of materials, produced by researchers or curated by staff in libraries and museums, that are becoming more accessible, but are not necessarily designed with student access and use in mind. Digital Humanities has brought together a substantial number of research projects, many of which concern the development of digital collections and resources http://digital.humanities.ox.ac.uk/. Museums and libraries are unlocking their collections in exciting new ways using digital media, for example: http://digital.bodleian.ox.ac.uk/; http://www.oum.ox.ac.uk/collections/.

The key barrier to students' exploitation of these valuable materials is lack of visibility and searchability.

The larger collections of material are easily located and organised in a user-friendly way: the greater the connection with a public-facing 'front-end' the more intuitive and searchable it is for students. However, it is still very difficult to negotiate the fragmentation of our resources, and for smaller collections and digital outputs the difficulties are increased. The key barrier to students' exploitation of these valuable materials is lack of visibility and searchability. The Research IT Board granted funding for the Bodleian to carry out a university-wide scoping project to improve search and discovery for all resources and intellectual assets. The project reported in Michaelmas term 2015 and included detailed consultations with students, recognising its relevance to education. The report will be publicized within the University in Hilary Term 2016.

Digital collections can be exploited in many ways to enhance teaching: a good case study is the CSlide project in Medical Sciences that was funded as part of the larger Wellcome Trust and Federation European Neuroscience Societies' History of Medical Sciences project

(http://history.medsci.ox.ac.uk/). The resources have enlarged this major international repository, but have also been re-purposed to teach students of anatomy. (www.medsci.ox.ac.uk/support-services/learning-technologies/learning-teaching-and-asssessment/cslide)

The Bodleian Libraries provides and maintains the Oxford University Research Archive (http://ora.ox.ac.uk) in which all theses and Oxford research outputs are intended to be deposited. It also maintains ORA-Data, Oxford's archival store for digital research data and is expert on resource description and discovery. The range of the Bodleian's provision of digital resources and the support the service provides is set out in Annex D.

5. RESOURCES AND FURTHER DEVELOPMENT

Development Area 5: To clarify, and agree the resources needed to develop digital education, where these might be most effectively situated, and how best funded.

ACADEMIC IT SERVICES

Academic IT Services should be sufficiently resourced to maintain existing and new key digital platforms.

The responsibility of a central IT service is to provide and support the core infrastructure on which any service relies, regardless of where the service is supplied – centrally, locally or via a third party. In addition, central services consolidate those where it makes more sense for one unit to provide them than duplicate across the University. These include key services such as Weblearn where a single VLE supported centrally is far more efficient and better for the user than multiple VLEs. (A full list of central services currently supported or being piloted by Academic IT Services is available in Annex C)

Academic IT Services plays a crucial role in providing core central support for the development of digital education. It already provides some key digital platforms and as argued in 3. Key Digital Platforms, above, there are additional platforms that need to be in place for the next phase of digital innovation in education.

Academic IT Services is currently a small group of staff who support both teaching and research activities.

SPECIALIST SUPPORT STAFF

In order to make significant progress in adopting and using technology in teaching, the University needs to invest in a network of specialist learning technologist support staff with a closer relationship to divisions and/or departments.

Whilst Academic IT Services can provide support on generic or multi-disciplinary services, in order to make significant progress in implementing this strategy, there is a clear requirement for individuals who have the right expertise to work at the interface between technology and subject specific knowledge, and who are able to identify the right tools and techniques for the subject area and teaching type. At present only the Medical Sciences Division and the Department for Continuing Education maintain small learning technology teams that can provide personalised support to academics in developing digital teaching and learning.

> *There is a clear requirement for individuals who have the right expertise to work at the interface between technology and subject specific knowledge.*

Where there has been or continues to be this kind of significant investment in local learning technologists, underpinned by a strategic objective, much more extensive use of technology to deliver or enhance learning takes place. The Medical Sciences is a particularly relevant example as distance learning is not its major business (whereas the motivation for investment of Continuing Education in TALL is more obvious), but a strategic decision to raise the level of engagement in educational technology across the division in 2003 led directly to the investment in a small learning technology team that has been transformative in the way teaching and assessment is delivered now compared to a decade ago. (For more information see www.medsci.ox.ac.uk/support-services/learning-technologies.)

It is strongly recommended that divisions consider developing a learning technologist role or roles to work as key facilitators between academic staff, and central and local support. We envisage a network embracing Academic IT Services, divisional counterparts, and other groups or individuals with expertise, experience and interest in digital education; a strong working relationship already exists between Academic IT Services, the MSDLT, and TALL. The role of divisional learning technologists (or departmental appointees) would be analogous to the role of research facilitators: having local knowledge of people and cultures, a manageable field of activity, building trust and relationships, advising, supporting, and liaising to get information and help when needed.

> *The value of such roles is multiplied when working as part of a network.*

The value of such roles is multiplied when working as part of a network, rather than being set up in isolation, and here there is scope to improve on the research facilitator structure by planning in advance how that would best work. Learning technologists have a very particular blend of academic and digital skills and a planned network, with a variety of job levels, coordinated with Academic IT Services, could do much to help with retention.

Many research facilitator posts were originally funded by the John Fell Fund. The University should consider a similar level of investment to establish learning technologist posts.

OTHER RESOURCES

The University should resource peer support networks, desktop self-help, and routine integration of the use of digital media in academic development programmes.

Academic IT Services will continue to play a vital role in encouraging innovation. The IT Innovation Fund and OxTalent awards have already generated a wide range of original teaching projects. The next stage is to ensure that projects become more widely known and stimulate colleagues to adopt the best and most successful of them. This requires better showcasing of digital education case studies via the web that enables academics to draw on the experience of their colleagues (some examples of peer-to-peer learning can be

> *The next stage is to ensure that projects become more widely known and stimulate colleagues to adopt the best and most successful of them.*

found here https://podcasts.ox.ac.uk/series/case-studies-innovative-practice). Additionally, events to showcase teaching and learning, including Learning Institute courses, could provide an opportunity for academics to pass on their experience to others face-to-face in larger groups.

> *The creation of templates for a number of use-scenarios would considerably reduce the time involved in initiating projects.*

This kind of peer support should be augmented with a set of self-help materials accessed from the desktop. For example, the creation of templates for a number of use-scenarios would considerably reduce the time involved in initiating projects. These exist in a number of places already, but require coordination and review to create a comprehensive and accessible resource. The network of learning technologists recommended above could be tasked to produce this in cooperation with Academic IT Services.

It is also crucial that academics are provided with the kind of training that they would find timely and relevant to their teaching. Currently, the IT services course programme is the major provider of training for academics in digital educational tools. There is an important future role for the Oxford Learning Institute in embedding digital education in their course portfolio. Training in course design and delivery using digital media should be routinely available in dialogue with the professional development courses that are within the Learning Institute portfolio: this is vital to maintain quality in all areas of the University's teaching. Academic IT Services might draw on the expertise of other learning technology groups in designing and delivering the training (e.g. TALL and MSDLT) but should take the lead in organisation and oversight.

> *Training in course design and delivery using digital media should be routinely available in dialogue with the professional development courses that are within the Learning Institute portfolio.*

Other kinds of web-based development material and face-to-face training sessions relevant to academics, need to keep pace with the evolving diversity in teaching and assessment methods being employed in the University and incorporate content that supports staff in adopting digital education and acknowledges its growing importance. OLI's support through its programmes and resources for lecturers and teachers will be a vital component of this strategy.

1. To extend the areas of excellence in digital education that already exist and to ensure that all departments and faculties regularly review how digital methods might enhance their teaching and learning provision:

   a) The University should continue to support local innovations by providing incentives and mechanisms for their development, and increase activity to maximise their impact
   b) All departments should be asked to set their own priorities for increasing the use of digital technology in enhancing education, and set out their targets for the next four years
   c) Departments and faculties are strongly encouraged to consider the role of digital education across the full range of their educational portfolio as part of their response and implementation plan.

2. To use appropriate digital technologies to develop more inclusive provision for different learning needs:
   a) Local priorities for increasing the use of digital technology in teaching and learning should be devised with inclusivity in mind.
   b) The University should anticipate adoption of assistive technology and the need to put in place training in its use for students and staff.

3. To support academic staff as innovative teachers by developing the functionality and usability of key digital platforms:
   a) Support the development of remote teaching by provision of a robust platform, standard templates, and routinely available training on good practice in distance learning.
   b) Those wishing to engage with a wider audience for their teaching, extending beyond enrolled students, should develop courses using one of the two VLEs currently in use (e.g. WebLearn or Moodle), supported by the appropriate University team.
   c) Support the development of an enabling infrastructure for the use of students' own devices in teaching events, and future-proof it.
   d) Support the development of an enabling infrastructure for online assessment.
   e) Provide as a core service a lecture capture platform and support to encourage the widest possible adoption.

4. To support students by making collections of resources more accessible and relevant to their learning:
   a) The University should utilise the expertise of the Bodleian Libraries and the recommendations of the University-wide Resource Discovery Project to identify solutions to enable new kinds of digital output to be discovered, made available to the public, and to be re-purposed for teaching students.

5. To clarify, and agree the resources needed to develop digital education, where these might be most effectively situated, and how best funded:
   a) Academic IT Services should be sufficiently resourced to maintain existing and new key digital platforms.

b) In order to make significant progress in adopting and using technology in teaching, the University needs to invest in a network of specialist learning technologist support staff with a closer relationship to divisions and/or departments.
c) The University should resource peer support networks, desktop self-help, and routine integration of the use of digital media in academic development programmes.

The University's Strategic Plan

The significance of the impact of technology on teaching and learning is recognised in the University's Strategic Plan[3]. Commitment 6 of the Plan is 'To ensure that the unique richness of the collegiate University's academic environment is both retained and refreshed'

Paragraph 40 relates this commitment explicitly to online and digital learning:

"Strengthening Oxford's global and digital online presence, as signalled in our new priorities, will ensure students studying at Oxford have improved access to materials. We will develop a digital education strategy which builds on our expertise in online learning to communicate knowledge created within the University. This will benefit all students, whether studying full-time, part-time, or through the flexible courses offered by the Department for Continuing Education, as well as staff, alumni, and wider society."

---

[3] www.ox.ac.uk/about/organisation/strategic-plan

Lecture capture technology

Lecture capture is the audio or video recording of lectures for secure storage and on-demand review by students. A pilot project took place in Oxford run by Academic IT Services and twenty-six departments, faculties and other units are currently participating or have expressed interest in participating. Lectures are accessed via the VLE (Weblearn) and students can re-run entire recordings, or use a word search to focus on particular aspects of lectures.

Research on impact on student attendance has shown it to be insignificant. Students use lecture capture for reinforcement of learning and not as a replacement.

For students the benefits are that they can:
- focus on listening rather than taking notes;
- review recordings to reinforce learning;
- revise material/ difficult concepts before exams;
- search for audio or text words within a recording;
- access lectures without assistance or special treatment (for those with disabilities).

Asynchronous use of lectures has advantages for many students in terms of access at flexible times and places: students on placements or studying abroad; part-time and executive education; missed lectures; lecture clashes; and facilitation of inter- and multidisciplinary work.

The benefits for staff are that the system supports:
- Innovative teaching practice;
- Non-intrusive recordings;
- Informality of recordings;
- Controlled student access through Weblearn;
- Option to download material and make available as podcasts.

ANNEX C: SERVICES PROVIDED BY ACADEMIC IT SERVICES

Academic IT Services works across the collegiate University to inspire and enable staff and students in the use of technology to strengthen Oxford's role as a world leader in teaching, learning, research and outreach. For further information about the services listed below, please send an email to academicit@it.ox.ac.uk.

Service	Description
Learning Technology Consultation	Consultation and advice on the application of digital technologies to enhance teaching, learning and assessment in the University. Learning technologies comprise generic and purpose-designed tools for advancing students' knowledge, collaboration and formative and summative assessment. They include simulation and modelling tools, quizzes, voting (polling) tools, online resources (including OER), mobile apps, discussion forums, blogs, wikis and social media. Consultation can include assistance in conducting research and evaluation with academics and students to better understand the experience and impact of technology-enhanced teaching and learning, and e-assessment.
WebLearn Course Sites	A web-based virtual learning environment (VLE) that supports teaching and learning in the University. WebLearn can be used to deliver online resources to students and includes specialised applications and tools such as lecture capture (Replay), plagiarism awareness (Turnitin), information about researcher training (Researcher Training Tool) and past exam papers (OXAM). Assistance in designing WebLearn sites is available.
Plagiarism Awareness (Turnitin)	An electronic text matching system that finds matches between the work submitted by students and existing electronic sources. Turnitin produces easy-to-read reports showing how much of a document is original, correctly cites other sources or is unoriginal. Students can also use Turnitin to ensure that they have cited their sources properly before submitting their work for assessment.
Open Educational Resources (OER)	Support for creating and publishing educational content under an appropriate Creative Commons Licence for reuse in the University and elsewhere. The content can be made available through a number of channels, including digital collections, Oxford Podcasts and third-party OER repositories.
Lecture Capture (Replay)	Automated recording of lectures and presentations. The recordings are made available to students through the WebLearn VLE for review and revision.
Media Publishing	Production of audio and video podcasts for publishing on Oxford Podcasts and iTunes U.
Video production	Production of broadcast-quality video for conferences, lectures and other University events. Videos can be live streamed and/or recorded for upload to the Web.

Service	Description
IT/AV Equipment for Learning Spaces	Consultation and advice on the selection, installation and support of IT and AV equipment in the University's learning spaces.
Video Conferencing (Room-based)	Fully equipped, bookable rooms in IT Services for holding video conferences.
IT Learning Programme (ITLP)	A broad range of classroom-based courses and workshops for staff and students to enhance their digital skills: e.g. media production, data analysis, programming and research skills. The ITLP can also provide courses for individual departments and groups, including customised training on a range of topics.
Online Video Courses (Lynda.com)	Lynda.com: an extensive online library of video-based material designed to foster professional development on a variety of topics, including software, creative and business skills.
IT Teaching Spaces	Bookable teaching spaces in IT Services' Banbury Road offices for holding group training sessions. Rooms are equipped with Windows and Mac workstations that include a variety of software applications.
Research Technology Consultation	Consultation and advice for researchers and postgraduate research students on the collection, analysis, management, publication and visualisation of research data. Data visualisation services include the use of statistical graphs, plots, tables, videos and charts to communicate data in printed publications and on websites. Data management services include advice on requirements for open access and assistance with the design and development of relational databases.
High Performance Computing (ARC)	Central infrastructure resource available to any Oxford University researcher who needs high performance computing (HPC).
Survey Design	Consultation and advice on the design of surveys for research and other purposes, including assistance with online survey tools: e.g. SurveyMonkey, the WebLearn Surveys tool and Bristol Online Surveys (BOS).
Public Engagement and Outreach	Consultation and advice on the use of digital technologies for public engagement and outreach. Technologies include social media, blogs, podcasts, games and crowdsourcing platforms. Consultation can include social media strategies, community building, community collection, events (e.g. edit-a-thons and hack-a-thons), open educational resources and strategies for evaluating impact.

ANNEX D: SERVICES PROVIDED BY THE BODLEIAN LIBRARIES

For further information about the services listed below, please send an email to reader.services@bodleian.ox.ac.uk.

Service	Description
Provision of digital information resources supporting education	Provision of digital information resources and digital catalogue records for physical items via SOLO (Search Oxford Libraries Online – http://solo.bodleian.ox.ac.uk. Digital collections include 60,000 e-journal titles, over 1 million journal articles, over 500,000 e-books, 450,000 digitised books, over 1,700 online databases and a growing numbers of data resources, approximately 2 million digitised images and the UK web archive (which is a twice-yearly snapshot of the whole of the UK web space) and numerous freely available online educational resources (see below).
Face-to-face support for teaching and learning activities	Support for students and academic colleagues in access to and use of digital education resources and tools provided by experienced and knowledgeable subject librarians in the Bodleian's 27 libraries, including the Radcliffe Science Library, the Old Bodleian Library, the Weston Library, the Social Sciences Library, the Taylor Library and others.
Digitisation services	Paid-for service for digitization of content, including scan-on-demand services for book chapters and journal articles; mass digitization of books and published content; bespoke service for archives, manuscripts and other unique content.
iSkills programme	Extensive and varied programme of courses and workshops open to students and academics which includes information discovery and searching for educational/scholarly materials; managing references, using citations and biographies; keeping up to date with research; measuring research impact and using research metrics; understanding copyright; publishing open access; managing research data; and using new technologies in research and education including using e-readers and tablets in an academic context. Annually there are approximately 10,000 attendances at iSkills training workshops and 1,000 face to face research consultations.
Centre for Digital Scholarship	A dedicated space recently opened in the Weston Library, Broad Street (formerly the New Bodleian library) with staffing funded by the John Fell Fund, the Bodleian Libraries and the Oxford e-Research Centre. Aims to foster support digital education and research, showcase digital research and education projects, provide a space for public engagement and impact and house workshops, training events and seminars in support of digital education and research.
Open Educational Resources	Support to create and publish educational materials and media (digital images, research materials, e-books etc) under an appropriate Creative Commons or other open licence to various digital channels. In certain subjects the Bodleian provides a set of high quality online materials including recorded masterclasses, podcasts, datasets, problem sheets via WebLearn and attempts to spread awareness and use of those materials as far as possible. Digital.Bodleian provides access to 120,000 images for education and research from a wider variety of digitized collections, with 1 million more already digitized and awaiting release.

Use of library spaces to support teaching activities

The Bodleian Libraries incorporates 27 libraries across Oxford. Many of these have bookable spaces which can be used to support teaching. The Social Sciences library has a dedicated Q-step centre which provides quantitative social sciences methods training.

Open access and research data management

The Bodleian Libraries provide and maintain the Oxford University Research Archive, ORA (http://ora.ox.ac.uk) and ORA-data as the University's institutional repository, collecting and providing open access to the university's digital theses, research outputs and datasets produced by researchers and students. All theses must be submitted to ORA as a condition of award of a master's degree or D.Phil, and most funders including HEFCE and RCUK require publications to be deposited. The repository is freely accessible.