

EMBEDDING DIGITAL AND INFORMATION LITERACY IN UNDERGRADUATE TEACHING

*Opportunities and
Implications for the LSE*

A dual approach is required, for Information Literacy and Digital Literacy skills to be successfully embedded into undergraduate teaching at the LSE. As explored in the CASCADE programme, student change agents provide contextualised, peer-to-peer support, but also important feedback on the kinds of issues faced by students, and the tools and technologies being used to overcome them and gain IL skills.

The 'top down' approach advocated by McGuinness (2007) is also needed to complement and support change agents. There needs to be increasing communication between academic faculty, academic support staff and librarians to better understand each other's roles and remits, and find areas for effective collaboration.

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Introduction

Information Literacy and Digital Literacy

Gaining skills in *Information Literacy* (IL) is a fundamental aspect of the University experience for undergraduate students, and provide essential tools for life-long learning. IL has even been described as “...*the core literacy which makes the others possible*” (Garner, 2006). Julien and Genuis (2011) view IL as being “...*necessary for academic success, effective participation in a digital society, and effective workplace information-seeking and use*”. Information literacy skills, including the ability to search for information in traditional print materials and online databases, form the basis of people's ability to find, evaluate, and use information in all aspects of their lives. People who are information literate are able to discern credible information from misinformation or disinformation, using information ethically and skilfully. In post-industrial societies, these skills are central to literacy and the quality of life in general (Julien & Genuis, 2011).

However, students and academic staff can often be ambiguous on what information literacy actually implies (Armstrong, Boden, Town, Woolley, & Webber, 2005), why it matters (Gross & Latham, 2009) and who is responsible for teaching these skills (Da Costa, 2010). The Chartered Institute of Library and Information Professionals (CILIP) in the UK define IL as Information literacy as: “...*knowing when and why you need information, where to find it, and how to evaluate, use and communicate it in an ethical manner*” (CILIP, 2011).

CILIP also implied that this definition is composed of several skills that are required to be information literate, requiring an understanding of:

- A need for information
- The resources available
- How to find information
- The need to evaluate results
- How to work with or exploit results
- Ethics and responsibility of use
- How to communicate or share your findings
- How to manage your findings (CILIP, 2011)

Digital Literacy and Digital Natives

The shift towards digital and digitized information has produced what Todd (2000) describes as “...*an information environment that is complex and fluid, connective and interactive, and diverse and unpredictable, and where the professional provision of information is no longer constrained by time and place*”. As the information environment has shifted from a paper-based to a digital one, the focus has shifted from Information Literacy to *Digital Literacy* (DL), which is defined as “...*those capabilities which fit an individual for living, learning and working in a digital society*” (Beetham, 2010). With this shift in focus, there also emerged the theory that the inhabitants of this new environment, namely students born after 1980, were inherently better suited to navigating its

challenges (Hargittai, 2010), and universities and academic libraries have had to reconsider how teaching and learning support is provided (Mountifield, 2006).

Digital Natives, or the Net Generation, as they came to be known, were presumed to have had the greatest exposure to digital technologies, and therefore would have sophisticated skills using these technologies (Prensky 2001; Oblinger & Oblinger 2005). Oblinger & Oblinger (2005) described this generation of students as "...*digitally literate, constantly connected to others, 'immediate' in nature, experiential learners and socially centred beings*" with learning preferences based on:

- learning and working in teams;
- structure with achievement-oriented goals;
- engagement and experience;
- visual and kinesthetic educational modalities and environments; and
- learning about things that they feel matter to them

Furthermore, Prensky (2001) argued that "*Today's students are no longer the people our educational system was designed to teach.*"

However, these presumptions have no basis in empirical evidence (Margaryan, Littlejohn, & Vojt, 2011). Selective and contextual use of technologies by students means experience using email, word processing tools and social networking on the internet does not necessarily transfer into digital or information literacy skills useful in academia, and increasing availability of information means digital literacy is an increasingly important issue (Pilerot, 2006).

Many DL skills are learned in a trial-and-error manner without direct support from educational institutions (White, Connaway, Le Cornu, & Hood, 2012), and only a minority of students have been found to use "*Web 2.0*" tools actively for educational purposes (Jones, Ramanau, Cross, & Healing, 2010), some even seeing Web 2.0 tools as a "*toy*" (Luo, 2010). Hargittai (2010) found that digital literacy skills and students' ability to use of the internet as a resource varies significantly, depending on the gender, ethnic identities and socioeconomic backgrounds of students. Through this study, Hargittai (2002) argued about the existence of a 'digital divide' where, as the internet has spread to the majority of the population, it is increasingly important to look at not only who uses the internet, but also to distinguish varying levels of online skills among individuals.

Digital literacy skills, particularly effective use of digital sources of information, are increasingly important in work and business, and form an integral part in IL and students' personal development. 77% of jobs in the UK require IT skills (e-skills, 2009), and an estimated £3.7 billion were lost by small and medium enterprises (SMEs) in the UK in 2005 as a result of inefficient use of digital information sources, and employers expect graduates to know how to locate, assess, and interpret information from a wide variety of information sources so information can be utilized for knowledge-building and decision-making purposes (Julien, Detlor, Serenko, Willson, & Lavallee, 2010).

Perceptions and responsibilities for Information and Digital Literacy

Librarians

Historically, librarians have been tasked with giving bibliographic instruction to students with the aim of instilling IL skills. However, as digital information sources became the primary source of information, students are able to bypass librarians altogether to access information (Driscoll, 2010), making the pedagogic roles and responsibilities of the librarian murky and without clear standards (Davis, Lundstrom, & Martin, 2011). In doing so, students often remain ambiguous about higher level information literacies, such as being able to identify appropriate sources of information, evaluate sources, adhere to copyright rules and standards, and effectively communicate their findings (Driscoll, 2010). Changing fee structures, student experience and access to digitized information on the internet, librarians have had to rethink their approach to teaching IL skills (McCluskey, 2011).

More fundamentally, McGuinness, (2007) argues that librarians tend to act in a reactive manner to the needs of academics, rather than proactively to promote IL skills. This reactive stance then leads to ad hoc, short-term solutions designed only to address one or two issues. Haynes, (1996) insists that librarians must take the initiative in promoting IL skills. Loomis, (1995) adds that librarians should align their own goals of incorporating IL skills into the curriculum with the goals of academics and institutions to influence the power structures within institutions and help shape educational content.

Faculty

The study by Davis et al. (2011) highlights both the ambiguity around how IL should be taught, and the important role faculty awareness of IL and integration of library staff plays in integrating IL. Indeed Weetman (2005) highlighted that librarians faced challenges generating interest among academic faculties on the long term benefits of IL, namely tackling the perception that IL could be taught via the process of ‘osmosis’ – a tacit assumption among faculty that students will absorb IL skills by conducting research for coursework, and by following the advice of academic advisors (McGuinness 2003).

Da Costa (2010) compared faculty perceptions of IL at institutions in the UK and the USA. At De Montfort university in the UK, Da Costa found that whilst 93% of academics in the architecture department and 96% of the Art and Design department wished their students to develop IL skills based on the ‘SCONUL Seven Pillars’ concept of IL (Bent & Stubbings, 2011), only 53% of activities in the Architecture department, and 56% in the Art and Design departments were undertaken to support the Seven Pillars through teaching, assessment or student-centred learning.

Faculty apathy, or even obstructiveness towards teaching IL can often be a source of conflict between academics and library professionals (Julien & Genuis, 2011). In order to unpack the “*culture clash*” between librarians and academics, McGuinness (2006) explored staff perceptions of IL at Sociology and Civil Engineering departments at Irish universities. She found that faculty felt they were already teaching IL skills through dissertation modules, general instruction from academic and

library staff and computer skills classes. However, McGuinness (2006) found that academics expected students to “*learn by doing*” through collaborative projects with peers and dissertation reports with occasional support from staff, without a clear sense of how students would develop critical and analytical IL skills. Faculty also tended to believe that a student’s ability to gain IL skills were driven by the student’s own motivation, interests and innate abilities, rather than the quality and format of the available instructional opportunities.

McGuinness (2006) concluded that academic faculty do not regard IL as a priority, and attributes these perceptions to the degree to which academics feel bound by the learning situations students will, or will not use, and on academics’ personal experiences at University. This leads to reluctance to deviate from traditional, passive methods of IL instruction which may lead to student resistance. McGuinness (2006) recommends promoting IL at an institutional level to academic staff by offering IL training, and promoting IL conferences, workshops and courses to staff, which could form an aspect of academics’ development criteria towards promotion and tenure.

Students

Contextualising IL, by integrating IL into undergraduate courses, and promoting IL skills to academic staff at an institutional level will only be effective if students also see the benefits of developing these skills. To quote Chapman and West-Burnham (2010) “*It is relatively easy to share dreams and visions with colleagues who are friends and have similar ideas. However, working with those who have very different visions demands different skills, including confidence in one’s own ideas and an ability to accept the perspectives of others*”.

Indeed, students may be unaware of IL requirements or their own skills in the area. If they are aware, students may recognize that their information skills are unlikely to be graded separately, and may be unwilling to spend time in developing competency in this area, therefore putting in the minimum amount of effort required to gain a pass grade (McGuinness, 2006). Gross & Latham (2009) investigated student perceptions of IL, by conducting semi-structured interviews with first year undergraduates at a US university. They found that none of the 20 students interviewed had never even heard of the term ‘information literacy’, and students struggled to recall recent assignments where IL skills were used. When asked to describe an information-seeking activity, students tended to believe that information seeking only needed to be measured by the ability to find information, and not the process used to reach that information, and qualities such as perseverance, curiosity and an ability to synthesise information were prized higher than knowledge of databases or Boolean logic. Science, maths and technology students even reported that these skills were irrelevant to their courses. When asked if students had any information skills they wished to improve, students either described not needing any further IL skills, or had basic requirements, such as information about library services.

Gross & Latham (2009) also tested students’ ability to predict their performance in an IL skills test, and compare their scores with peers to see if IL skills were affected by competency theory (Kruger & Dunning, 1999). Competency theory argues that incompetent people tend to believe they have

above average skills, particularly when they have some orientation in the area, and overestimate their abilities when tested. To quote Kruger & Dunning (1999) “...[Incompetent people] *suffer a dual burden: not only do they reach erroneous conclusions and make unfortunate choices, but their incompetence robs them of the ability to realize it*”. The study found an association between low-level skills and an inflated self-view of ability for estimates of performance made both before and after taking an information literacy skills test. Students with scores in the non-proficient range also estimated that their performance was above average as compared to their peers, and students with high Grade Point Average Scores (GPA) were not necessarily information literate.

The rise of digital information sources provides both opportunities to engage students with IL, and complications in IL instruction, as students turn to Google before their academic librarians without knowing how to navigate the vast amounts of data available on the internet. Luo (2010) explored librarians’ experiences teaching DL skills to undergraduate students using social media tools, which include technologies such as social networking sites, wikis, blogs and social bookmarking tools. Luo found that 84% ($N=50$) librarians surveyed used social media tools to instruct students, and students had a positive reaction towards integrating social media in IL classes. However these reactions were based on anecdotal feedback from librarians, as the study did not specifically measure students’ perceptions.

Students faced a number of challenges integrating social media whilst learning about IL. These included technical challenges, such as inexperience with HTML formats and online vandalism of wikis.

The most significant challenge, however, was students’ preconceptions of social media. The study found that students did not have a uniform level of IT competency, and some students had never used social media technologies. On the other hand, frequent users of the social media tools like YouTube or Facebook, tended to use them as a “toy”; interested only in the social and entertainment aspects, and unaware of the educational potential of these technologies. Finally, some students lacked interest in certain tools, such as social bookmarking tools like del.icio.us. which could be due to their lack of need for such tools both academically and personally (Luo, 2010).

Whilst IL and DL skills are recognised as important for lifelong learning and development by librarians, academics, and even some students, disjointed perceptions and lack of clear ownership on the provision of DL and IL has meant that these skills are often not fully integrated into curricula and institutional strategies (Beetham, McGill, & Littlejohn, 2009)

Method

This paper aims to explore the ambiguous and complex discourse on IL through the perceptions of students, academics and librarians, and to review some of the programmes being piloted by universities in the UK to understand and embed DL skills into undergraduate teaching.

Embedding Digital and Information Literacy in Undergraduate Teaching

Recent considerations on changing the nature of IL and DL provision at the London School of Economics and Political Science (LSE) by the LSE Library, Centre for Learning Technology (CLT) and Teaching and Learning Centre (TLC) provide the context behind this report. Specifically, this report reviewed recent literature on IL and DL looking to address the following questions:

1. *Perceptions and responsibilities for Digital Literacy* – What does DL mean to:
 - Librarians
 - Academics
 - Students?
2. *Embedding Digital Literacy* – What are universities in the UK doing to embed DL into undergraduate teaching?

A literature search for the review was conducted using Google Scholar, The British and Australian Education Indexes, and “Summon” resource retrieval software used by the London School of Economics and Political Science Library. Throughout this paper, the term IL refers to a collection of literacies involved with seeking, evaluating, incorporating and communicating information, including information literacy. DL in the context of this report, is considered to be the skills and understanding required to implement IL using digital tools, including social media and ICT. Please see Figure 1 below for an explanation of how DL fits into a wider definition of IL.

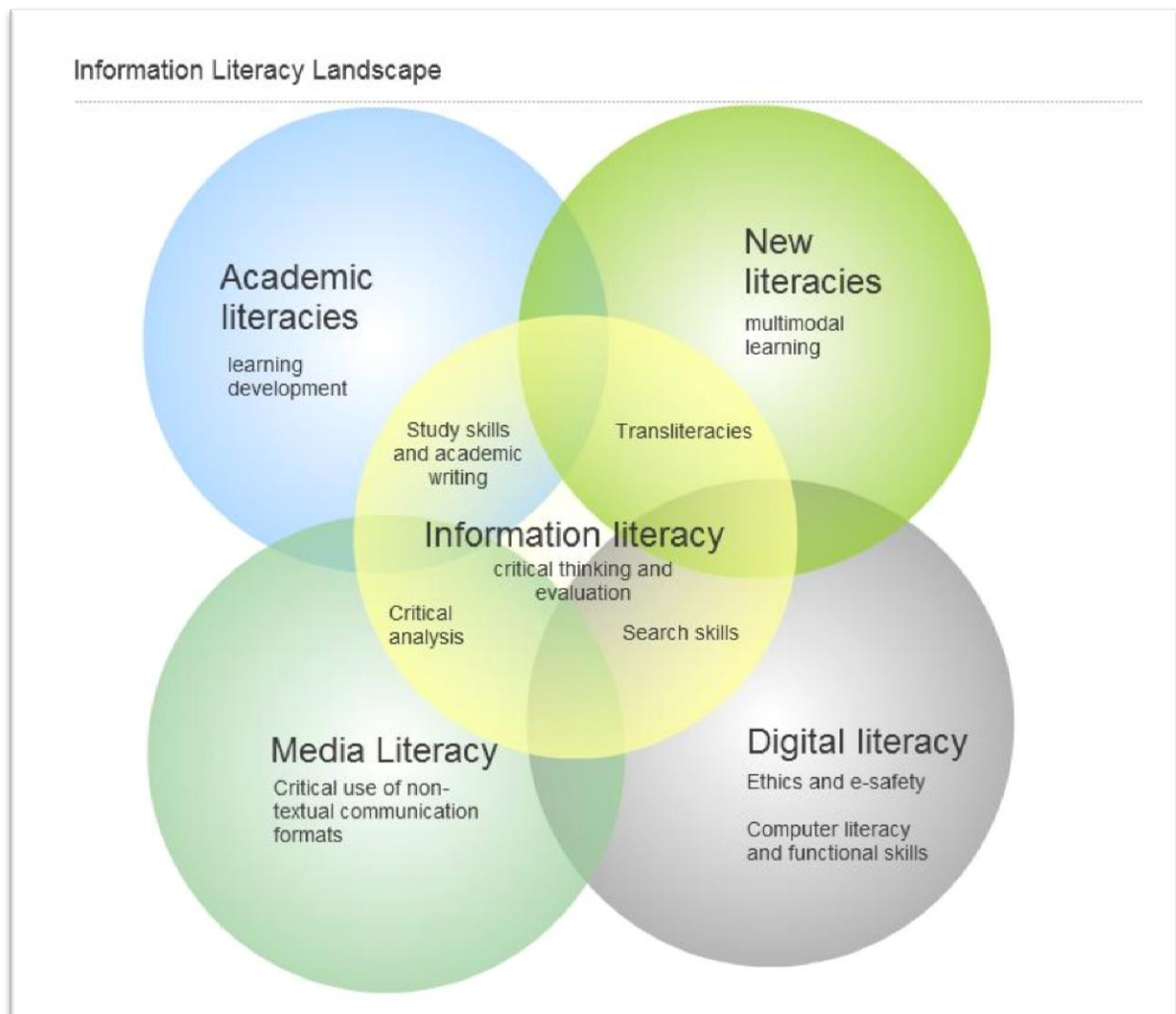


Figure 1: Venn diagram showing the IL landscape, and the position of DL within (Secker & Coonan, 2013).

Embedding Digital Literacy

Compartmentalized vs. distributed model of teaching DL

Currently, there are two basic models for delivering DL; compartmentalized and distributed (S. Bell, 2008). Compartmentalized models include for credit modules in DL based at academic libraries (Badke, 2008). Badke argues that information literacy is crucial to a full education, and expecting students to gain DL skills by doing research is misguided. Furthermore, Badke argues that students need specific training to be able to navigate the vast quantity and complexity of information to be able to conduct research, and should be credited for doing so. Research suggests that for credit

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modules could help students (Kemp, 2006) and academic staff (Auer & Krupar, 2005) to interact more with library staff and get a deeper understanding of the role of librarians in teaching DL.

The distributed model of incorporating IL includes course-integrated instruction courses, where IL is integrated into courses across many disciplines and spread throughout the student's academic career (Bell 2008). Bell argues that this method of integrating IL allows students to understand IL in the context of their subject, and does not give academics the option to relinquish the responsibility of teaching DL to librarians. However, librarians, especially entry-level librarians, may lack the necessary skills and attitudes to be able to teach IL skills to students. 86.2% of librarians surveyed by Julien & Genuis (2011) prepared for instructional work informally whilst already working as librarians. Furthermore Julien & Genuis argue that the resulting anxiety and discomfort in teaching IL may even lead to overt hostility from some library staff, and staff expected to give IL instruction will be unsuccessful in doing so unless they are willing and able to take responsibility for that instruction.

Davis et al. (2011) surveyed librarians' attitudes towards these two models of teaching IL to students at US universities to gauge attitudes towards these models and librarians' self-perceptions on their roles in teaching IL. Of librarians who taught both models of IL instruction, 58.7% agreed with the statement "I find for-credit information literacy courses more effective than course-integrated information literacy sessions", compared to 14.4% for the same statement who only taught course-integrated modules. Through this discrepancy, the authors concluded that neither method of teaching IL could yet claim to be more effective, as librarians often only had experience of teaching IL through either course-integrated, or for-credit courses, and may have bias based on their experiences.

Interestingly, Davis et al. (2011) also explored the political dimension of teaching IL and found that librarians who teach both models of IL instruction believe that course-integrated sessions (80.9%) are slightly more politically important than for-credit IL courses (72%). This finding suggests that librarians who teach for-credit courses feel more isolated than those who teach course-integrated IL because of a lack of faculty awareness, especially if the class is not tied to a discipline. Since most teaching faculty play at least some role in course-integrated classes by either team-teaching with librarians or consulting with the librarian about the research assignment, more faculty are aware of librarians who follow this approach. Course-integrated library instruction may simply be more visible to non-library faculty on campus.

In the following section, 4 projects looking to embed DL skills in to their institution's curriculum will be compared, and the strengths and weaknesses of the projects identified. The projects include the London School of Economics (LSE) "A New Curriculum for Information Literacy" (ANCIL) framework (M. Bell, Secker, & Moon, 2012); The CASCADE programme conducted at Exeter University (L. Dunne, Beetham, & Potter, 2011); the Digital Department project at University College London (UCL) and the SEEDPoD project at Plymouth University.

LSE ANCIL framework

A *New Curriculum for Information Literacy* (ANCIL) framework was developed following the findings of the Arcadia project at Cambridge University (Coonan & Secker, 2011), aiming “...to help undergraduate learners to develop a high-level, reflective understanding of information contexts and issues which will empower them with a robust framework for handling new information situations, and to generate strategies for evaluating, analysing and assimilating that information as needed and at the time it is required”.

The framework focuses on IL skills based on 10 strands:

1. Transition to Higher Education
2. Independent learning
3. Academic literacies
4. Mapping the information landscape
5. Resource discovery in your discipline
6. Managing information
7. Ethical use of information
8. Presenting and communication
9. Synthesis and knowledge creation
10. Social dimension of information

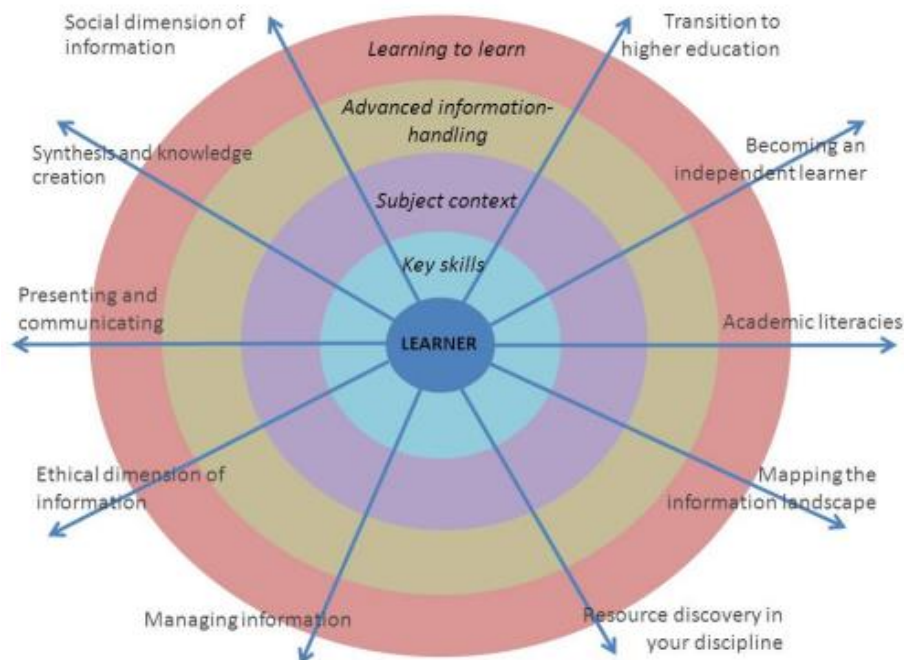


Figure 2: Overview of the ANCIL framework (Coonan & Secker, 2011).

The framework aims to embed DL into course modules, and aims to provide “*scaffolded learning*” to undergraduates, by providing introductory modules in the early years of undergraduate programmes, which are steadily withdrawn as the course progresses to promote autonomous learning. The framework would be customisable depending on the needs of disciplines and individual cohorts within them, and reflective of new technologies and tools (Coonan & Secker, 2011). Coonan & Secker, (2011) suggest that, due to the holistic nature of the ANCIL framework, the framework needed to be implemented not just by the librarians, but also a range of staff including academics and support staff. They also suggested having pre-sessional audits of students to evaluate students’ existing DL skills, as well as regular assessment, including peer assessment of DL skills, throughout a student’s undergraduate career.

Based on this framework, a review of IL skills was undertaken at the London School of Economics and Political Science between March and August 2012 (M. Bell et al., 2012). The aim of the review was to:

- map existing information literacy support for undergraduates offered by the various academic and support departments at LSE
- highlight existing examples of good practice
- identify any significant gaps in provision
- benchmark existing provision against the ANCIL framework (optional and compulsory)
- better understand the role of Academic Support Librarians in supporting undergraduate students (M. Bell et al., 2012)

The project found that undergraduate students were less likely to seek out IL support and training. However, several departments demonstrated good practise in IL and DL instructions towards their undergraduate students, and these departments suggested that undergraduate students needed to be “*scaffolded*” in their learning, with greater IL and DL instruction being offered as students transit from higher education into the LSE, with gradual reduction in instruction as students progress through their course (M. Bell et al., 2012).

M. Bell et al. (2012) concluded that it was important that staff and students have an understanding of what IL and DL skills are, why they matter, and who is responsible for teaching these skills. 8 recommendations were made on how these suggestions could be implemented:

1. LSE to develop an information and digital literacy strategy or framework to inform teaching and support in this area across the School.
2. The strategy or framework makes the roles and responsibilities for information literacy provision explicit (tied to roles not individuals) to ensure accountability and to also ensure

there is a clear documented referral policy for students seeking help and support beyond what is provided in programmes.

3. Building on the inclusion of digital and information literacies into the LSE PG Certificate in Higher Education, a more extensive staff development programme is launched to support LSE staff to ensure that they understand the importance of these literacies and how to embed them into their undergraduate programmes. It would also ensure staff understood their obligations and the role of the different support services.
4. A network of information and digital literacy champions is established across LSE to support the strategy and staff development programme. These would include staff from both central support and academic departments.
5. A study to understand the needs of students entering higher education which could be undertaken with Widening Participation team.
6. Two pilots with academic departments are undertaken in 2012/13 to embed information and digital literacy into undergraduate programmes and to evaluate the impact and implications of this work in terms of benefits to students, time in the curriculum and staffing.
7. The role of Academic Support Librarians in delivering information literacy support will be reviewed to ensure consistency across departments and a greater recognition of this role amongst academic staff. The Library will develop a portfolio of training that can be customised and offered to all undergraduate programmes.
8. Communication between central support services and academic departments will be reviewed to explore further possibilities to join up student support either in standalone or embedded courses.

Since these recommendations were made in 2012, the LSE is now taking action, and strategies to embed DL into undergraduate programme are being explored. CLT has received funding towards a project aiming to produce student ambassadors for digital literacy in two academic departments at the LSE.

JISC Developing Digital Literacies programme

In order to develop DL skills in UK students, the Joint Information Systems Committee (JISC) launched a £1.5 million Developing Digital Literacies programme, running from July 2011 – July 2013 (JISC, 2013). The programme was informed by the scoping report conducted by Beetham (2010), and aimed “...to promote the development of coherent, inclusive and holistic institutional strategies and organisational approaches for developing digital literacies for all staff and students in UK further and higher education” (JISC, 2013). These projects aim to address IL and DL skills at a holistic level, and are looking to work with librarians, academic staff, students and support staff to develop IL and DL

skills. Given the relevance and timeliness of the JISC programme, the next section of this report will consider several of these projects and their interim findings however as the projects are due to finish in July 2013, it is anticipated that further issues will emerge.

The Exeter CASCADE Project

The CASCADE project at the University of Exeter adopted an embedded, contextualised approach to transferring DL skills, by focusing on the experiences of postgraduate researchers as “Change Agents”, who ‘cascade’ digital know-how across the University (L. Dunne et al., 2011). The project also looked at institutional approaches to DL, identifying taught modules in which to embed research activities promoting DL skills. The project outputs were published into three sections:

- Developing digital scholars aimed at postgraduate and undergraduate students
 - Including Researcher resources, such as the multimedia module, glossary of available technologies and briefings on how researchers can use DL skills.
- Developing the digital curriculum aimed at staff
 - Including case studies from each of the six University of Exeter colleges, DL teaching resources and thematic videos.
- Developing the digital university aimed at instilling DL at an institutional level
 - Including findings and lessons from the project as a whole; reports on project outcomes; case studies and videos (Potter, 2013).

Whilst this is still an on-going project, the CASCADE project has already reported some of its findings using postgraduate interns as change agents (Potter, 2013). The project found that graduates had no definitive set of digital capabilities, and digital skills were specific to the course content, and the use of digital technologies was highly personalised even within subjects. The use of Digital technologies also depended on the interns' knowledge of those technologies, and whether that technology was intrinsic to the research they were conducting. Interns also developed a critical attitude towards digital technologies, recognising the limits of these technologies, as well as their benefits. The CASCADE project also considered the potential negative impacts of digital technologies, such as distractions to researchers, ethical use of information and maintaining academic rigour (Potter, 2013).

UCL Digital Department

The JISC funded 'Digital Department' project at UCL explores the digital skills of Teaching Administrators (TA) with the view benchmarking Digital Literacy skills for these staff, and supporting them to attain accreditation via a Certified Membership to the Association of Learning Technologists (CMALT). The project targeted TAs as change agents in order to bypass academic resistance, by training them to provide 'just in time' solutions to academic staff, and because TAs often manage VLE resources and communicate directly with students, facilitating key educational processes such as assessment.

The project built upon the Digital Experience Building in University Teaching (DEBUT) project, run at Canterbury Christ Church University (Westerman & Graham-Matheson, 2008), which produced a

community of 'digital envoys' at that university, and argued that providing DL skills to a wider pool of staff was more effective in terms of cost and sustainability, than relying on learning technology units to respond reactively to the DL needs of staff.

Plymouth University SEEDPoD

Plymouth University's 'Student Experience Enhancement thru Driving the Plymouth Embedding Of Digital literacies' (SEEDPoD) project aims to build on the review of Teaching and Learning Strategy, and looks to identify and implement a range of appropriate interventions that will instigate a step change in adoption of the digital skills in students, staff, and at an institutional level.

The project looks to normalise DLs as part of the student experience, and will investigate, implement and evaluate strategies, frameworks, technologies and associated interventions and policies that will assist in the embedding of DLs in to the curriculum delivery (short term) and design (long term) processes.

The SEEDPoD project has already started to provide guides for postgraduate researchers and academic staff on how to embed DL into their research and teaching through online guides and videos available through their website (SEEDPoD, 2013).

Comparisons and Discussion

The projects considered in this report take a multi-dimensional approach to embedding DL skills, engaging with students through DL embedded curricula, providing DL tools and by empowering students to be "change agents".

Whilst there are many similarities between the IL and DL frameworks deployed by the LSE ANCIL programme and the JISC programmes, the focus on working directly with undergraduate students is more noticeable in the former. Since three of the projects considered in this report have yet to report their findings formally, the author can only evaluate the principles used to embed DL being considered in these projects. An update to this paper will be produced once all three JISC projects considered in this report have reported their findings.

Change agents

Three of the four projects considered in this review propose the use of "change agents" to promote DL skills to students and staff alike. The CASCADE programme reports using postgraduate researchers directly as change agents, due to their existing experiences using digital technologies for research, and ability to contextualise DL skills to their respective subjects, which can have a direct impact on their community of students. The use of students as change agents follows a previous project conducted on the subject at the University of Exeter in 2010 (E. Dunne & Zandstra, 2011), where students were asked to formulate and manage projects on DL and pedagogic issues. The project found that students were keen to be involved as change agents, and were full of ideas of for their own projects, and the projects were successful in identifying good practise in teaching DL to undergraduate students, and also led to the adoption of technologies, such as lecture podcasts and changes to the way the university handled feedback and assessments. However, students were not

able to support the project consistently, due to their own course commitments, and required significant support from academic staff in order to conduct scoping exercises. Furthermore, this project recognised that institutions needed to consider students as partners and proactive contributors to learning communities, rather than as customers, whose feedback needed a more reactive response (Little, Locke, Scesa, & Williams, 2009).

The ANCIL programme and the UCL Digital Department programme both suggest the use of academic support staff to be the change agents to implement DL skills. Indeed, academic support staff may be ideally suited to be change agents, due to their access to academics and students, and the opportunity to embed IL and DL skills at an institutional level through their role in assisting the development of curricula. However, McGuinness (2007) argues that long-term viability for embedding IL and DL skills are not guaranteed if IL change agents, be they librarians or support staff, who are given “on-off” (or in the case of the UCL digital department project, “just in time support”) opportunities to provide DL instruction.

The efficacy of change agents is also heavily affected by the continued support of academics implementing their recommendations. Bruce (2001) argues that librarians and support staff are more successful in longer-term collaboration with academics, when they “hook” academics by tapping into the wider university agenda, such as their own political interests in promoting lifelong learning and “core skills”, and tackling issues of research quality and plagiarism. It is also important that change agents, be they librarians, academic support staff or students, are resilient to changes in student, staff and academic populations.

Dorner, Taylor, & Hodson-Carlton, (2001) found that initial student and academic interest in a tiered research skills course was affected by the departure of academics who had initially supported the project, which raised questions about the long-term viability of the project. In the Dorner et al. (2001) case, department-wide support and coordination was sought out to continue this project and ensure its long-term viability. This was achieved when the coordinators for the course secured support from the committee responsible for setting the curriculum.

Embedding DL into the curriculum

Embedding DL skills into the curriculum is a key aspect of the CASCADE and ANCIL projects. The LSE has been running two courses on core IL skills; LSE100 for Undergraduates, and MY592 for postgraduate researchers. Since the CASCADE project has yet to report on their findings, it is not yet possible to see the ways in which DL skills have been incorporated specifically. Johnson, Edmundson-Bird, & Keegan (2012) argue that assessment needs to be at the heart of any measure looking to embed DL skills, and suggest that the following features are important when considering embedding DL skills into a curriculum:

- alignment of learning outcomes, core curricula and assessment task
- clear guidance about what skills will be valued and their ranking
- authentic task within discipline, and ideally external interest
- strong requirement for critical reflection.

They argue that it is important to be clear on the DL skills that the institution wishes to instill among students. Skills, such as critical evaluation of tools such as search engines, copyrighting and wikis could easily be embedded into the curriculum, whilst other technologies, such as video presentation, for example, may require a more contextualised approach (Johnson et al., 2012).

Furthermore, Stubbings & Franklin (2006) at Loughborough University observed that institutional support is also vital to successful incorporation of DL into the curriculum, as even if academics are active in their support, and embed DL skills in to their modules, these skills may not filter up to a programme level due to lack of academics' control or influence over departmental regulations and pedagogical structures.

Indeed McGuinness (2007, p.32) insists that embedding DL skills needs to have a top down approach, and a broader, institution-wide shift in culture to ensure that these programmes have successful collaborations between students, librarians and academics, leading to the long-term sustainability and viability. This may include programmes such as providing DL training directly to academics, ensuring that academics understand the importance of IL and DL skills, which is a proven method of ensuring DL and IL skills are effectively transferred to their students (Smith & Mundt, 1997).

Several authors argue that effective partnerships and an interest in pedagogy are prerequisite for successful top-down approaches to embedding IL skills (McCluskey, 2011; McGuinness, 2007; Stubbings & Franklin, 2006). Wenger (2000) argues that successful partnerships depend on participants' ability to design themselves around, and participate in a social learning system, where competence is socially defined. In the case of IL, the success criteria for embedding IL skills depends, on mutually accepted competencies within the department-academic-librarian-student social learning system, such as the students' ability to use technology and IL skills to navigate academic assessments. Therefore, mutual negotiation is required to define those competencies, and all actors must be prepared to compromise in order to align themselves to wider institutional interests.

Conclusion

The Alexandria Proclamation of 2005 declared that *"Information Literacy lies at the core of lifelong learning. It empowers people in all walks of life to seek, evaluate, use and create information effectively to achieve their personal, social, occupational and educational goals. It is a basic human right in a digital world and promotes social inclusion of all nations"* (UNESCO, 2005). As IL skills have taken on a digital dimension, this proclamation could also be applied to DL skills, and embedding DL skills into undergraduate teaching is a powerful method of enabling future graduates to overcome challenges not just in their chosen career paths, but also in everyday life.

Whilst IL and DL skills in undergraduates has been neglected in general teaching, and often delegated to librarians to deal with in ad hoc fashions, the projects undertaken by JISC and the LSE indicate a shift in culture which is beginning to understand the fundamental value of students being information literate. However, the continued success of these projects requires serious strategic

considerations as well as direct empowerment of students, and needs long-term institution wide support and collaboration (McGuinness, 2007). There is a need for continued efforts to break down political barriers, such as academic apathy and lack of student engagement.

Recommendations for LSE

A dual approach, including strategic engagement and ground level support is required, for IL and DL to be successfully embedded into undergraduate teaching at the LSE. As explored in the CASCADE programme, student change agents provide contextualised, peer-to-peer support, but also important feedback on the kinds of issues faced by students, and the tools and technologies being used to overcome them. However student change agents at an undergraduate level are also needed to help ensure that students at undergraduate levels are able to access DL resources and gain IL skills. Indeed, the Centre for Learning Technology at the LSE is actively exploring this strand, and has received support for a project to install student ambassadors for DL in two academic departments.

Findings from such a programme could then be fed into the 'top down' approach advocated by McGuinness (2007). Due to the independent nature of departments at the LSE, departments in favour of actively embedding DL and IL skills in curricula could initially be approached to run a series of pilot projects, the results of which could be used to lobby other departments if successful. Finally the literature indicates that there needs to be increasing communication between academic faculty, academic support staff and librarians to better understand each other's roles and remits, and find areas for effective collaboration. It is anticipated that this report will be updated in October 2013 to take into account further outputs from the JISC digital literacy projects and to report further on progress at LSE.

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