Learner Use of Online Content: implications for teachers

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Abstract

The Open Educational Resources (OER) movement is conventionally dated from the time in 2001 when the Massachusetts Institute of Technology (MIT) announced that it would put its complete programme catalogue online – thus it has been under way for around 12 years. However until recently the focus across the world has been on *provision* of resources: even in the last few years the only other focus was on *provision-related* issues such as quality, accreditation, and usability. Apart from the major (but specific) studies of user needs and behaviour done by MIT and a few open universities there has until recently been little else that focussed on issues of *learners* and how (and why) they use OER. This chapter aims to fill that gap. It is based largely on a survey of the OER literature, linked to a survey of the wider literature on online resources where one can draw conclusions relevant to OER. Conclusions are drawn for teachers, lecturers and instructors. The chapter ends with a brief discussion of ongoing research challenges.

1.   An overview of the issue and its relevance

In early 2011 a team at Sero Consulting was contracted by the Higher Education Academy as part of the JISC/Higher Education Academy OER Programme (JISC, 2009), to carry out a rapid study of learner use of online resources (including but not only OER) for learning. This project rapidly became known as LUOERL and has its own wiki where all results are stored (LUOERL, 2012).

JISC (2011) noted that the project was:

> "*a short literature review to provide a greater understanding of the ways in which learners, whether or not in formal education, use online resources to aid their learning experiences and the factors which influence the selection of resources. The resultant report provides a basis for additional work being commissioned by the [Higher Education] Academy and JISC to examine the potential contribution open educational resources can make to the student learning experience. It is hoped that collectively this work will enable practitioners, policy makers and researchers to adopt more effective evidence-informed or research-informed approaches to their decision-making, research and practice on matters relating to the use of open-educational resources in learning and teaching*"

Twelve areas of interest for the research were required by the Higher Education Academy to be researched by the study: learners' rationale for searching for online resources; types of online resources being sought; complexity/granularity of resources being sought; how resources found are used; whether learners in some subject areas appear to conduct more searches for online resources than others; educational level of resources being sought; location of resources; extent to which resources are the principal or a supplementary source of learning materials; whether or not learners are in formal education; enablers and barriers to use of online resources; how learners retain access to the resources; and provenance information and copyright status of resources being used.

During the course of the study a small number of additional topics forced themselves to the researchers' attention and these have been added to the analysis in section 2 below.

The topic of learner use was picked up again when the POERUP project, part-financed by the Lifelong Learning Programme of the European Commission, started in November 2011. POERUP, Policies for OER Uptake, (POERUP, 2013) is a collaborative project stretching until Spring 2014 which is carrying out a survey of countries' approaches to OER, creating a global database of OER initiatives, researching a number of detailed case studies including on the UK, and piloting a range of ideas on institutional and national policies which would tend to foster the uptake of OER. POERUP partners include Sero (who leads the project), the University of Leicester, Dutch Open University, and

Athabasca University (Canada), along with other partners in France, Italy and Hungary. Involvement in POERUP led to a process of reflection on the earlier LUOERL report, in the much more international context of POERUP. The POERUP wiki contains specially written reports on OER in UK, Netherlands, Canada, Mexico, France, Belgium, Spain and around 10 other countries.

Our conclusions from our studies on learner use of OER (and online resources more generally) can be summarised as follows.

There is clear evidence to confirm the gut feeling of many academics (especially those engaged in distance teaching) that students' rationale for searching is dominated by assessment requirements, explicit or implicit. When they come to select relevant resources, students lack understanding of provenance and quality aspects of resources.

Students tend to prefer audio to video (confirming what many devotees of podcasting and critics of video have been saying for years). Despite the need to be competitive and private when it comes to assessment (as traditionally constructed), students demonstrated positive attitudes to sharing.

There are lessons also for how academics should organise material. The studies demonstrated learner need for structure in or above the resources; and thus the importance of a task-based pedagogy that guides learner use. Students use of multiple methods for discovery (browsing, search engine, tutor and peer guidance), but their particular approach is more shaped by pedagogical task context than by subject area differences or other contextual variables.

The research literature gives no answer or only weakly evidenced answers to a number of perennial questions:

1. Is there any link of OER to student attainment? Only one key study could be found to demonstrate that.

2. Is there any information on how students store and 'curate' (not a word that they would use) resources they have found? Only one key study addressed how learners retain access to resources.

It was rather clearer that a more nuanced approach to digital literacy than the 'digital natives/digital immigrants' discourse was now gaining traction in the literature.

There is a little bit of evidence, confirming the beliefs of many academics involved in resource-based learning, that there is a substantial challenge in designing resources for users with unknown characteristics – it is much easier to do this when characteristics are known.

2.   The major theoretical insights that have arisen from the research

These insights are classified under headings taken from a 12-item classification required by the Higher Education Academy for use in LUOERL and extended in the project and for this chapter as new research insights came into play.

2.1   Learners' rationale for searching for online resources

There seem to be no 'meta studies' of students' motivation for searching specifically for OER resources. However, there are a number of surveys of individual OER projects – some of which (such as Carson's MIT surveys) are of sufficient scale to be usable: Carson (2009) observes:

- Of *students* using OER, 44% said it was to enhance personal knowledge, 39% said it was to complement a course and 12% said it was to plan a course of study.

- Of *self-learners* using OER, 41% said it was to explore interests outside of the professional field, 20% said it was to plan future study, 17% said it was to review basic concepts in their field and 11% said it was to remain current in their field.

The Open Universiteit Nederland (OUNL) OpenER project was aimed specifically at those who had not "successfully attended higher education" (Schuwer *et al*., 2007). Reasons given (respondents were allowed more than one choice) for visiting the site were:
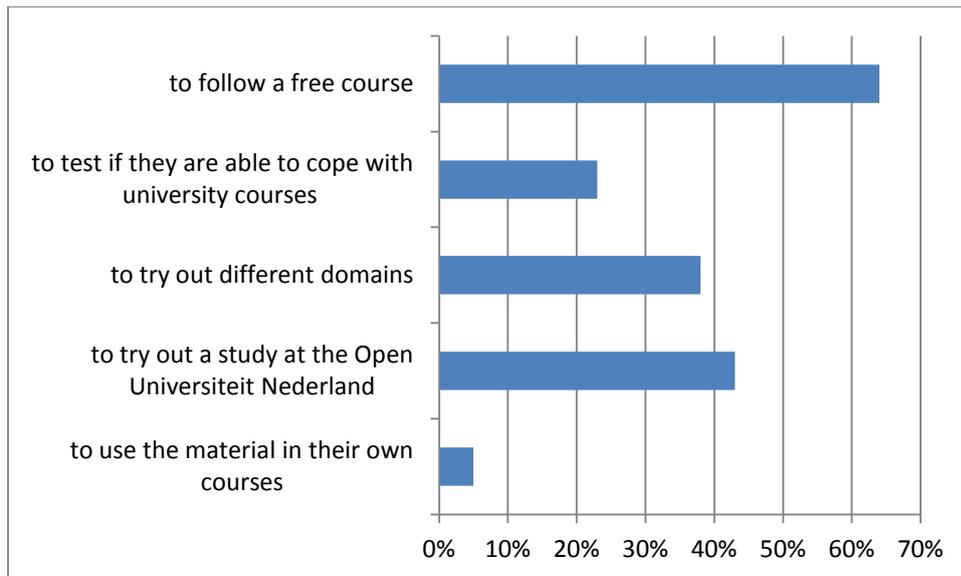
Slightly less identifiable as the 'rationale' for visiting but still of interest is the student ranking of The Open University's Open Learn (Godwin & McAndrew, 2008) features. The authors' findings suggest that while some learners seek stronger communication tools, there is a need to refrain from promoting social networking as desirable to all learners. Perhaps key among their conclusions is that consideration should always be given to providing links to assessment and accreditation. Responses in order of importance to students range from "a large choice of content" (1st in importance) down to "to be able to interact with other learners" (10th).

In the wider context the literature surveyed typically addresses the search for online resources in relation to isolated research tasks performed within a traditional course context (e.g. to complete one's homework or perform an isolated in-class task), and thus motivators are considered in this light. This is consistent with the general belief among experts that student learning is substantially driven by assessment, perhaps increasingly so with full-time students at campus universities (it has been true for part-time students at open universities for many years).

'Research content' is moreover typically seen as a source for assignments, with students' perception of research very much led by the context of their assignments (Hampton-Reeves *et al*., 2009). Some authors suggest that, in light of this, research assignments should include details about expectations for conducting quality research (Head, 2007).

More generally, students' rationale for seeking *online* resources over other options boils down to ease of use/access (i.e. anytime, anywhere); efficiency; and streamlined searchability (i.e. ability to search thousands or even millions of resources at once). It is generally taken for granted that the

contemporary student's research projects will begin with a simple Google-type search for online resources. (See the chapter by Gabe.)

2.2   Types of online resources being sought

It appears that the desire to *provide* OER has initially been driven by the *supply* side and rarely, yet, in response to learner preferences. However, this should not undermine the value of student surveys – in fact, considering the dearth of research, such studies possibly assume greater importance.

The University of Oxford *Listening for Impact* research (a JISC-funded study) into podcasting (Geng *et al.*, 2011) found that the resources produced were popular among students and external users (learners and teachers) alike. This popularity was growing considerably (from 7% who had listened to podcasts from the Oxford portal in November 2010 to 33% in February 2011) and is expected to continue on an upward trend. Students reported that they particularly valued the podcasts because the lectures were 'related' to their own course or subject, that they had supporting resources linked and that they could be played in-line (i.e. in the location where they had been accessed/discovered).

The podcasts were made available via iTunes, and the authors noted the significant external influence exerted by Apple, e.g. the boost when iTunes entered new educational markets such as China.

In the US, OER videos from the Kahn Academy were used to explain to students the Sub-Prime Lending Crisis and the collected student responses demonstrated very high levels of satisfaction with the assignment. It should be noted that the videos that comprise the Kahn collection are relatively short (10-20 minutes) and are designed to be appropriate for students to view on a computer (McDowell, 2010).

In the wider context, findings suggest that today's learners utilise numerous types of OER and non-OER media including not only the obvious ones (e-books, web sites, images) but also:

- Wikipedia articles (Field, 2006; Luyt *et al.*, 2008; Lim, 2009; Chandler & Gregory, 2010; Menchen-Trevino & Hargittai, 2011; Clark *et al.*, 2011) ;

- videos, e.g. Khan Academy/YouTube (Johnson *et al.*, 2010; Wong *et al.*, 2010; Winn, 2010; Brownell, 2009) – there are many more.

2.3   Complexity/granularity of resources being sought

There seem to be apparent tensions and contradictions in relation to the granularity that may be sought by students, and the need for contextualising and the 'pedagogic wrapper', reflected throughout the wider research. Lane's studies of OpenLearn led him to conclude:

> *"The effectiveness of open educational material is usually improved where there is a clear sense making structure"* (Lane, 2007, p. 5)

This is supported by the findings of the University of Nottingham team, which looked at reusable learning objects for health studies. While they acknowledged that increasing the 'specificity' of the objects can significantly reduce the potential for reuse, they found that this was a necessary trade-off.

At the OUNL it was found that the OpenER courses were considered of much greater appeal if they contained not simply content but also "learning guidance and exercises" and if they could be completed with a test or exam (Mulder, 2007).

2.4   How resources found are used

Lane *et al*. (2009, p. 5) found similar evidence that users appreciated:

> *"... the chance to dip in and take bits out of courses without having to worry about doing the whole thing."*

They also found that these users, and indeed others who were already UKOU students, also valued the opportunity to make contact with peers. Notwithstanding the caveats above with regard to "social networking" (Godwin & McAndrew, 2008) it appears that some students use OpenLearn as an additional communication tool. The resources may initially draw them in but they then have access to a new group of peers (Lane *et al*., 2009).

Wilson surveyed students prior to OpenLearn starting, with responses revealing a hunger for assessment (90%), qualifications (89%) and tutorials (64%) (Wilson, 2008).

The Open Nottingham Project surveyed undergraduates about how they had used the repurposed geographical data handouts – with 67% saying to better help them understand the topic, 56% as a revision resource and 44% reporting they had "cited them in an assignment" (Stapleton *et al*., 2011). With specific regard to podcasts, the Listening for Impact survey found that the resources were considered of most use to catch-up when a lecture had been missed, to stimulate interest in that subject and/or as an aid to revision (Geng *et al*., 2011).

This topic is well worth revisiting in future work, as OER begins to blend with the world of MOOCs. A Massive Open Online Course (MOOC) is a type of online course aimed at large-scale participation and open access via the web (Wikipedia, 2013). Many researchers believe that MOOCs are a fundamentally new paradigm. In contrast, many distance learning theorists do not believe that MOOCs are new, or better. One of the most senior such theorists is Sir John Daniel: his paper (Daniel, 2012) is required reading and has an extensive bibliography. A useful review and contextualisation of this paper is McAndrew and Jones (2012) which adds a perspective from the Open University. Bacsich (2012b) provides a brief introduction to the strategic aspects of MOOCs in a wider perspective of 'archetypal' models of online education.

2.5   Whether learners in some subject areas appear to conduct more searches for online resources than others

There seem to be no substantial studies of disciplinary difference with regard specifically to OERs. However, the findings from the wider context may well have considerable read-across. Prefacing their report of Caledonian University students, Margaryan *et al*. (2011) note that previous studies into technology use by students have shown considerable variations: with higher usage among technology and business studies students and lower among the arts, languages, social and healthcare. However, they counsel caution in analysing such data since they were concerned with what are now increasingly redundant technologies such as CD-ROMs. Their study supports the view that the 'digital natives and digital immigrants' thesis may distort perceptions of students and that a much more nuanced discussion is now required. It would appear from the study that there may still be some distinctions between younger and older students but that these must be seen in much wider contexts.

Surveys of student search behaviour is examined elsewhere within single subjects (e.g. Physics, Nursing and English Composition), but not in a comparative – or quantitative – context (Dee & Stanley, 2005; Jamali & Nicholas, 2008; McClure & Clink, 2008).

2.6   Educational level of resources being sought

Most of the more substantial studies have concentrated on undergraduates, or the use of undergraduate-level materials to engage non-traditional students.

There is evidence that users at all academic levels are (on a basic search level) engaged in nearly *identical* search methods despite their differing requirements as learners – that is, commencing with a simple Google search. Studies trace the search patterns of students as young as primary school age, as well as those of PhD students, and all levels of resource are pursued along the way. As undergraduate students are the subject of most studies located, though, in this case the majority of resources being sought are indeed at the undergraduate level.

There are also many studies asserting that high-level postsecondary students *do* spend a good deal of time in search of journal articles (Nicholas *et al*., 2006, 2009, and 2011).

2.7   Location of resources most likely to be used

This chapter has focused largely on English-language papers and thus mostly deals with education in the English-speaking world (and largely on higher education). This will clearly have an influence on where the resources are used. The vast majority of resources reviewed (via the papers on them) have been hosted in the US and the UK.

McAndrew *et al*. (2008) reported that access to OpenLearn had been "truly global" with access from 225 'domains' (countries/territories). UK access over the duration of the two-year period was approximately 30%. The 2009 annual MIT survey (Carson, 2009) illustrated a similarly international perspective with 54% of the traffic coming from outside of the US including 11% from Western Europe.

Podcasts created and released for the *Listening for Impact* project at the University of Oxford were accessed, and in some cases reused, by listeners from around the globe. Feedback received indicates that these listeners came from a broad spectrum of backgrounds from the professions (education, law, medicine) to current students and as well as the retired (Geng *et al*., 2011). The project was seen as particularly successful in attracting students 'new to Oxford'.

Given the population and number of universities in the US – and the breadth of the OER activities now underway in that country across the educational and public sectors, it seems likely that most resources are hosted in the US.

On the other hand, in relation to general penetration of OERs in an *organised* effort across the entire higher education sector, the UK would be in the lead.

However, since many students seem now to use Wikipedia articles in their studies (not to mention YouTube etc.), the concept of 'which country' an item is hosted in is rather elusive, an interesting twist on the 'globalisation' of learning.

However, since many postsecondary students use (via automatic authentication) full-text journal articles from a wide variety of publishers and repositories, the issue of the host country for such material is not clear, nor – we suspect – of great interest to students.

2.8 Extent to which resources are the principal or a supplementary source of learning materials

From the existing research this question remains impossible to answer with any certainty or clarity. OER range from the smallest level of granularity to entire course modules or courses. These may be used in a variety of ways depending on the context of the learner. In the majority of studies, the OER have apparently been *designed* as supplementary materials – which may not be the same as how they have been *used*.

For an investigation of OER as the *principal source of learning* materials see the Carnegie Mellon OLI (Lovett *et al.*, 2008).

Recent developments such as the OER University (WikiEducator, 2012a) and the first of the accredited courses launched from this by the University of Southern Queensland (WikiEducator, 2012b) imply that OER as the principal source of learning materials will be an increasingly important issue for at least some universities. Of course this puts much more pressure on the usability and quality of the OER. Such aspects of OER can be benchmarked in the same way as other aspects of online learning (Pick&Mix, 2011).

2.9 Whether or not learners are in formal education

It is difficult to make an accurate assessment since one of the driving forces for those involved in OER creation and release is to *broaden participation* – particularly among non-traditional learners.

The OpenER at OUNL was one such project but it is still noteworthy that 43% had not participated in higher education before; 75% of the survey respondents were at the time "not involved in any formal learning trajectory" (Schuwer *et al.*, 2007, p. 101); and – exploring a separate issue – "60% were female" (p. 100). At MIT 43% of visitors describe themselves as "self-learners", as opposed to students or educators (Carson, 2009).

In the earlier period at OpenLearn the dominant age group was 35-54 year olds. Unlike the other studies, other characteristics of the visitors included 'well-educated' and 'confident'; and many already had an 'existing connection' with the UKOU (Godwin, 2008).

Of course it seems often to be the case that learners may be in formal education 'somewhere' but not necessarily at the institution providing the resources. In some countries with well-developed credit transfer systems (US and Sweden in particular) students may be taking courses from several institutions *simultaneously*.

2.10 Enablers and barriers to use of online resources

Most relevant OER research seems to be on barriers not enablers. (This is more extensively explored in Gabe's chapter.) The wider research implies that most of the barriers to the use of OER are either the same as or a consequence of more generic barriers to *accessing and using technologies for learning*. However, the issues of *designing* learning for the 'unknown user' and the tensions between granularity and the need for scaffolding permeate much of the research – even if they do not achieve the profile we may have imagined.

> *"In its (OER) current level of deployment, however, does it necessarily support 'meaningful learning'?"* (Esslemont, 2007, p. 44)*.

In the wider context, the literature review identifies numerous enablers and barriers to use of online resources. An obvious enabler is access to simple search engines like Google, directing users to

simply displayed results. This accommodates what is seen as a contemporary learner preference for quick fact extraction and brief viewing, as opposed to continuous reading, as noted by the e-Books Observatory (anon, 2009). Today's students favour brevity, consensus, and currency in the information sources they seek (Head & Eisenberg, 2009); resources easily accessed, interacted with, and departed from make all the difference. Today's young learners have often expressed a desire that digital libraries should, generally speaking, be "more like Google" (Bell, 2004).

Researchers warn that young people are seen to rely overly heavily on search engines, to "view rather than read", and to be lacking the critical and analytical skills to assess the information that they find on the web. In this sense they are not truly "web literate" (Nicholas *et al.*, 2008). Many students use Google but are bewildered by the number of responses it generates, and will rarely look beyond the first few pages of search results (Hampton-Reeves *et al.*, 2009); hence any website that asks them to *engage deeply* feels disruptive to their learning (Nicholas *et al.*, 2006). Connaway *et al.* (2011) find that in some situations, information seekers will "readily sacrifice content for convenience"; issues of time and levels of difficulty in obtaining information are usually of more concern to students than issues of accuracy (Weiler, 2005).

A surprising number of authors point out that today's student is more amenable to "the human touch" than is typically presumed (Connaway *et al.*, 2008; Hampton-Reeves *et al.*, 2009). Guidance in search methodology, personalised training sessions, and uses for 'human resources' (i.e. mentors, tutors, even parents) as key enablers are recommended by numerous authors – though several note an intriguing reluctance by students to work with librarians (Head & Eisenberg, 2009).

On the other hand, an oft-identified barrier is publishers' embargoes on various materials; students are frustrated when a promised resource is suddenly unavailable, and lose trust in the resources they are using (Wong *et al.*, 2010). There is also evidence that a single bad experience, e.g. 'no results found', with a resource can put a user off it permanently (Matusiak, 2006).

2.11   How learners retain access to the resources

The only systematic study of how learners *retained* access to the resources appears to be Lim's (2009) study of Wikipedia. Wikipedia was used more frequently (for accessing resources) than library databases – which comprised the smallest frequent user group. However, slightly more than half of the respondents accessed Wikipedia through a search engine, while nearly half accessed it via their own bookmarks.

It is tempting to move on from this research to a wider discussion of the validity of Wikipedia. However we see this as just one example of the wider problem of ensuring that students make value judgements on the quality and reliability of all sources of information. It is quite reasonable for students – and researchers – to use heuristics to make these value judgements, but not ones as crude as "Britannica good, Wikipedia bad". There is a particular onus on academics: it is just not good enough to 'ban' Wikipedia or to say that one never uses it so one cannot make judgements. In reality, many researchers use Wikipedia. External examiners (in countries like the UK which have then) should be a key influence, especially when it comes to final year and Masters dissertations.

One should not conflate Wikipedia with wikis in general. Wikipedia is a wiki but there are many other wikis with relevant information and most of them are managed in very different ways from Wikipedia. The examples we are familiar with might be called 'professional wikis' – these are wikis, such as VISCED where only professionals in the subject are allowed to edit (Re.ViCa, 2013). Perhaps not surprisingly, that is conducive to higher quality, but no guarantee of it.

Returning to the safer ground of the topic of this subsection, students have various approaches to the issue of retaining access. Some still like paper: several contemporary surveys show that, if given the option, students will opt to print out longer texts (Sweat-Guy *et al.*, 2007). Other students like to use a web browser's tabs as an organisational tool. They may then bookmark their findings, or copy and paste them as notes into a Word document; email items to themselves; etc. Some use more sophisticated features such as RefWorks, EndNote, etc. (Wong *et al.*, 2010).

2.12   Provenance information and copyright status of resources being used; and learners' awareness of this

Much of the wider research backs up a finding of students' inconsistent attitudes to provenance. The experience of the OUNL OpenER project is overwhelmingly that students expect the courses to be of a suitable academic level and that the university is the guarantor of quality. Elsewhere, many students seem content to take on trust the validity of resources found on the web. Lim's (2009) study of students' use of Wikipedia suggested that students tend to use it for rapid fact checking and background information, and that they had generally had good experiences of it as a resource. However, their perceptions of it its 'information quality' did not reflect this (see the prior subsection also).

In the wider context, Menchen-Trevino and Hargittai (2011), Hampton-Reeves *et al.* (2009), and others examine this issue, finding that students are not generally sophisticated in their understanding of things like peer-review or currency: "there is a common view that if something is published it must be reliable" (Hampton-Reeves *et al.*, 2009). Lorenzen (2001) finds that students are weak at determining the quality of the information that they found on a website, and may in fact judge the validity of a website based on 'how elaborate it looks'.

2.13   How do learners search for/discover online resources?

As with much of the thematic analysis of OER, the literature here militates against comparative study. The key variables concern whether the users of OER are already informal learners, enrolled students and/or whether they have been directed to resources by lecturers.

The 2009 Carson MIT survey reports the statistics below for how the visitors arrived (Carson, 2009).
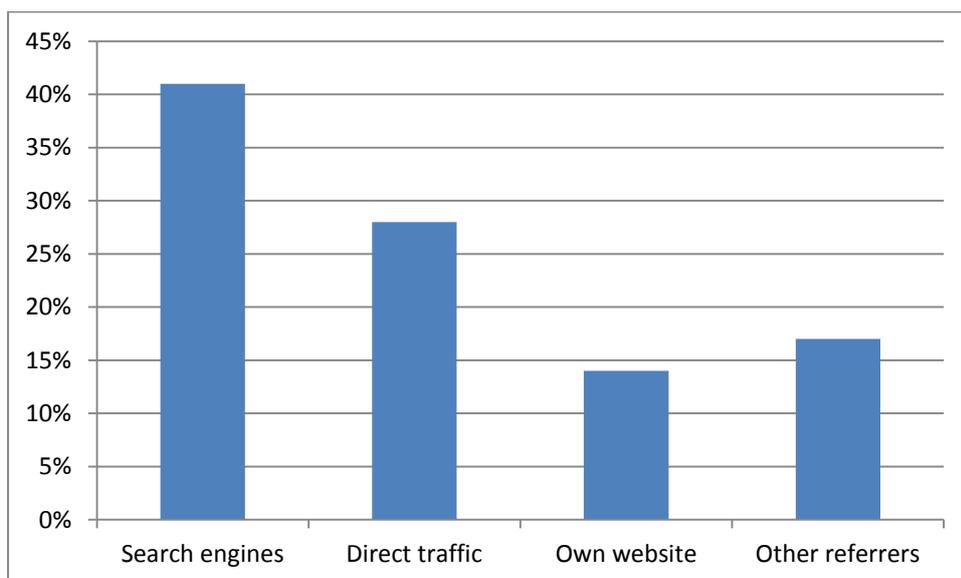
In the Open Nottingham project survey, 35% of respondents said they had previously used OER (Stapleton *et al.*, 2011). Of these, they found the resources in various ways as follows.
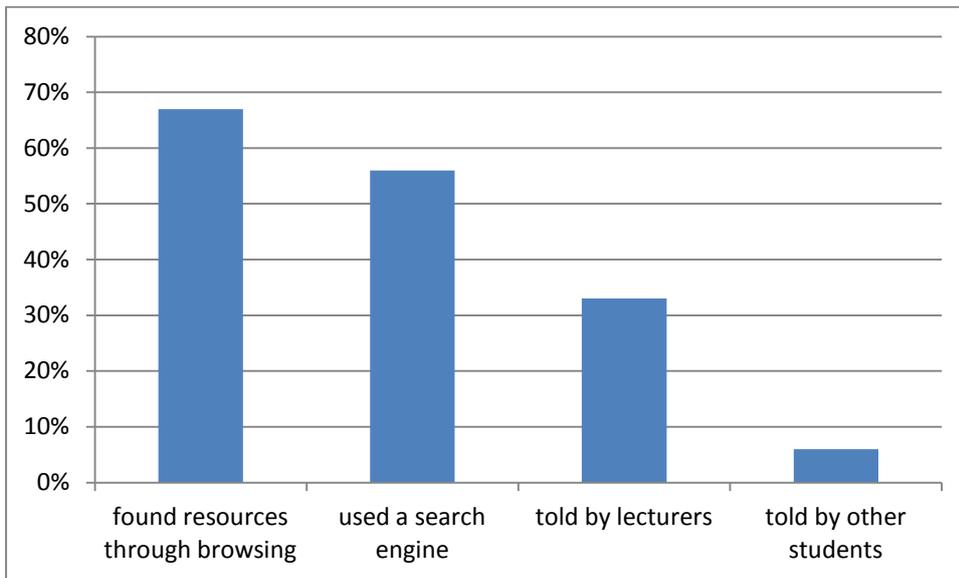
2.14   Do OER influence selection of courses or institutions?

There was evidence from some JISC/HEA OER projects that availability of OER content was having a positive influence on students' choice of course – in cases such as the University of Westminster MSc in Multimedia this was seen "strong" and, if integrated into the institutional marketing strategy, has the potential to yield immediate returns (Stannard, 2010).

Elsewhere, evidence on a more significant scale is presented by the MIT OCW initiative where 35% of 'freshmen' said they were aware of OCW before making the decision to attend MIT and had been influenced by its availability (Carson, 2006, 2009).

2.15   Do OER have an impact on students' attainment?

This is a very hard question, and the 'no significant difference' debates are as intense as those over the 'digital natives' issue.

The Open Learning Initiative (OLI) at Carnegie Mellon began in 2002 and, as such, is one of the few OER programmes of sufficient maturity and stability to test the impact on student learning. OLI undertook three studies of the Statistics course with the aims of a) investigating whether students could learn as much from stand-alone OER course as a 'traditional' instructor-led course and b) investigating the potential for accelerated learning using the OER course in 'hybrid' mode. The studies involved 'class size' groups measured against peer control groups over a single semester Statistics course.

The results demonstrated that the students working on the stand-alone OER course achieved almost identical scores to those on the traditional instructor-led course and outperformed the national average – thus meeting the 'no harm done' test. The accelerated learning study revealed that the students using the hybrid model learnt 15 weeks' worth of material 'as well or better' than the traditional learners in just eight weeks. Both groups of students were shown to have spent the same amount of time *actually studying* and retention of knowledge was roughly equal – with perhaps a slight edge to the hybrid learners group. On all other measures the hybrid group were at least the equal of the traditional learners.

The researchers suggest that the reason for this accelerated learning is that (due in no small part to the OER course design) the OER learners engaged more meaningfully with the materials, used their time more effectively and were better prepared for the classes (Lovett *et al.*, 2008).

2.16   Role of university libraries

Libraries are a critical conduit to digital resources, just as they were for print resources. A number of stereotypes of student use (non-use) of libraries are not borne out by the research. Interestingly, undergraduates and postgraduates are the largest group of users of university library links to access scholarly databases, suggesting an important 'hot link' role for libraries (Nicholas *et al.*, 2009) for them and not only for researchers. Students use libraries often, and consider both reference librarians and library databases extremely helpful (Head, 2007). Students are (still) very reliant on library catalogues (Hampton-Reeves *et al.*, 2009).

In one study, nine out of ten students turned to libraries to conduct course-related research via online scholarly research databases (Head & Eisenberg, 2009). In terms of more modern approaches libraries tend to guide e-book selection and retrieval (anon, 2009).

2.17   Learners' choice of digital resources, and choice of tools

Insights into the learners' choice of digital resources and choice of tools were surprising and noteworthy. Knowledge that a system is free and has worthwhile contents apparently makes a substantial contribution to reducing abandoned-access attempts (Peterson Bishop, 1998). Resource selection is based on prior knowledge and experience, e.g. a belief (whether or not true) that resources provided by Google and Google Scholar are reliable and relevant (Wong *et al., 20*10).

Respondents employ a consistent and predictable research strategy for finding information, whether they are conducting course-related or everyday-life research (Head & Eisenberg, 2009). Too much so – sadly, students repeatedly select the method that initially provided them with successful results and almost never try to explore other options (Matusiak, 2006). In fact, preference for digital tool types is predictable by gender/age (anon, 2009) but there is a correlation to subject matter (Pan *et al.*, 2006).

2.18   Role of Google

Almost all users starts with Google; and wants their digital library to be more like it, rather than to have less familiar search tools. Google (and a few similar commercial internet search engines) dominate students' information-seeking strategy. 45% of students use Google when first locating information, with the university library catalogue used by 10% (Griffiths & Brophy, 2005). Almost all students use course readings and Google first for course-related research (Head & Eisenberg, 2009).

More experienced researchers link to publication gateways via Google/Google scholar, then stay on a journal site only long enough to collect the article (Nicholas *et al.*, 2011).

All end-users (students and researchers) want: direct links to online content; text and media formats; evaluative content, such as summaries/abstracts, tables of contents and excerpts; relevant search results; item availability information; and simple keyword search with an advanced, guided search option. Thus libraries need to offer 'Google-like' functionality and availability (i.e. be open 24 hours a day) and familiar search modes to meet user expectations (Connaway *et al.*, 2011).

Use of library-supplied databases may in fact be *increasing* due to the ubiquity of full-text, and the ease with which it can be associated with online indexes (Medeiros, 2009) – in other words, the

library is becoming more like Google. The evolution of the Library is explored in the literature on Library 2.0 . This is:

> "*a loosely defined model for a modernized form of library service that reflects a transition within the library world in the way that services are delivered to users. The focus is on user-centered change and participation in the creation of content and community. The concept of Library 2.0 borrows from that of Business 2.0 and Web 2.0 and follows some of the same underlying philosophies. This includes online services like the use of OPAC systems and an increased flow of information from the user back to the library.*" (Wikipedia, 2012)

For those who are concerned about citing Wikipedia, see Chad & Miller (2005) which covers similar ground and if that seems too commercial there is a recent research study for JISC (Adamson, Bacsich, Chad, Kay, & Plenderleith, 2008) – one of

> "*several studies [that] have been done to put flesh on the bones of the Library 2.0 concept. Furthermore, many librarians are experimenting with blogs, wikis, and other web 2.0 systems including social networking, to better track and gain feedback from their users. There are even a few innovative Library 2.0 systems in operation.*" (Bacsich, 2012, p. 183)

3.   *Implications for teachers and institutions*

We make the following recommendations, phrased primarily in terms of staff engaged in the teaching process but also with relevance to institutional managers and leaders:

- Staff should pay more attention to student views and experience of OER and online resources. Quality and benchmarking schemes and associated survey instruments can easily be updated to accommodate a greater focus on content. In addition to EU work especially from OPAL (2011), the benchmarking e-learning scheme Pick&Mix has an OER mode (Pick&Mix, 2011).

- Institutions with their academic staff should consider how best to foster judicious use of resources (including OER) by students, especially in their project and dissertation work. Ideally a *Guide to Good Practice* is required. This would be particularly fruitful to foster in the UK context because of the External Examiner system and the roles of the Quality Assurance Agency and Higher Education Academy. The structure for this Guide could draw on a number of sources including the Pick&Mix (2011) version mentioned above.

- In course redesign, staff should aim to make more use of OER and externally provided free-of-charge, non-open resources in future programmes.

- Staff should ensure when providing public information about their courses that descriptions of 'study time' and 'contact hours' for courses do not get trapped into a classroom-based narrative that does not provide a realistic description of the learner experience in relation to OER and online systems. This is becoming particularly relevant as the recommendations in the Higher Education White Paper for England *Students at the Heart of the System* (BIS, 2011) come to pass. This is a particular issue in some European countries where the current regime at ministry level is suggesting a 'back to tradition' approach towards learning and teaching without seeming to appreciate the benefits of IT.

4. *Open questions and directions for future research and implications for OER practice*

4.1 Overview

In a nutshell, there is still a great deal to be researched about learner views and use of OER and online resources generally. The literature on learner use of online educational resources is very immature. There are significant gaps in the literature: there are almost no meso-level studies, few international comparisons, and very little on learners other than university undergraduates. It would be very useful to see if the findings were similar for postgraduates and for corporate staff undergoing professional development. The overwhelming majority of published studies do not generalise beyond their particular contexts of study and there is no consistent research approach.

Despite the large amount of activity in the UK on the creation of OER, there is still a large gap on learner experience work related to OER, especially in relation to larger-scale studies. There is a significant research opportunity.

4.2 Suggested research work

Learner use projects

There is still a widespread lack of learner-focused evaluation projects in specific techno-pedagogic areas, such as student use of Wikipedia (including search and quality judgements that students make).

There is largely virgin territory for any researchers wishing to investigate student study-time issues for students accessing OER and online resources. Time "is strangely under-examined in the literature of e-learning" (Goodyear, 2006, as cited in Bacsich, 2011) and that situation has changed little in the last six years: Bacsich (2011) analyses some of the differences in approach between education and the corporate world. Thus we counsel a little caution when extrapolating conclusions of this paper to the corporate training world.

There is a clear need to have more research on student experience of *formal* learning using OER both at campus-based universities and in distance teaching mode. Regarding the latter, as the OER u (WikiEducator 2012a) develops and similar networks of nil- or low-cost online providers come into existence such as Coursera (2012), EdX (2012) or UniversityNow (2012), this will be a fruitful area of research.

Extending the language coverage

It would be prudent for appropriate researchers to check the own-language literature on learner use from the Netherlands and Sweden, even though the number of hits is not likely to be large. There appears to be a more substantial literature in Spanish and to a lesser extent in French. The LUOERL report (JISC, 2011, p. 20) gives preliminary information buried in footnotes.

There is across the European Union a surprising disconnect between the OER community and the 'elite' of e-learning research (perceived or self-styled) – judged in relation to such metrics as the Research Excellence Framework (UK); EU Framework Programme and EU Lifelong Learning Programme grant holders; grant holders and committee members of the UK Economic and Social Research Council Technology Enhanced Learning Committee; members of the Association of Learning Technology Research Committee; and journal editors of e-learning journals. There is the clear exception of the UK Open University with some key individuals at the OU, and at a few other locations. It may possibly be an artefact of our perspective on these countries but this disconnect seems a little less the case in the Netherlands and Canada.

In an ideal world, in order to establish the area of OER as a research activity worthy of the attention of the best scholars in e-learning, a comprehensive open, editable and re-purposable bibliography of research papers and other literature on OER should be generated – an *Open Educational Bibliography*. This needs an international consortium to support it – and some, at least, international funding. Some European developments – in particular POERUP, the EU project on *Policies for OER Uptake* – touch on this and can leverage on the LUOERL work, which created two large Mendeley databases of OER research related to learners. There are US foundations supporting several strands of OER research including from the Hewlett Foundation at the Open University (2012) in the UK, but more substantial international collaboration – and in particular North America-EU collaboration – is needed. A preliminary grassroots global collaboration is under way to build the World OER Map (Green, 2012) of OER initiatives and Athabasca University is fostering the OER Knowledge Cloud (2012) of research papers on OER, thus there is much to build on – and sustain, with many gaps in our knowledge of OER awaiting the attention of academics and researchers.

4.4　Acknowledgements

5.　References

The References are in three sections, first of all general references and then two sections corresponding to the two sections of the existing online bibliographies in Mendeley from which the References are drawn:

- Learner Use of OER – http://www.mendeley.com/groups/1074991/learner-use-of-oer/

- Learner Use of Non-OER Online Resources – http://www.mendeley.com/groups/1098021/learner-use-of-non-oer-online-resources/

Note that the references selected in each case are only small percentages of the total references online in Mendeley for the LUOERL study.

All URLs were checked on 18 January 2013.

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